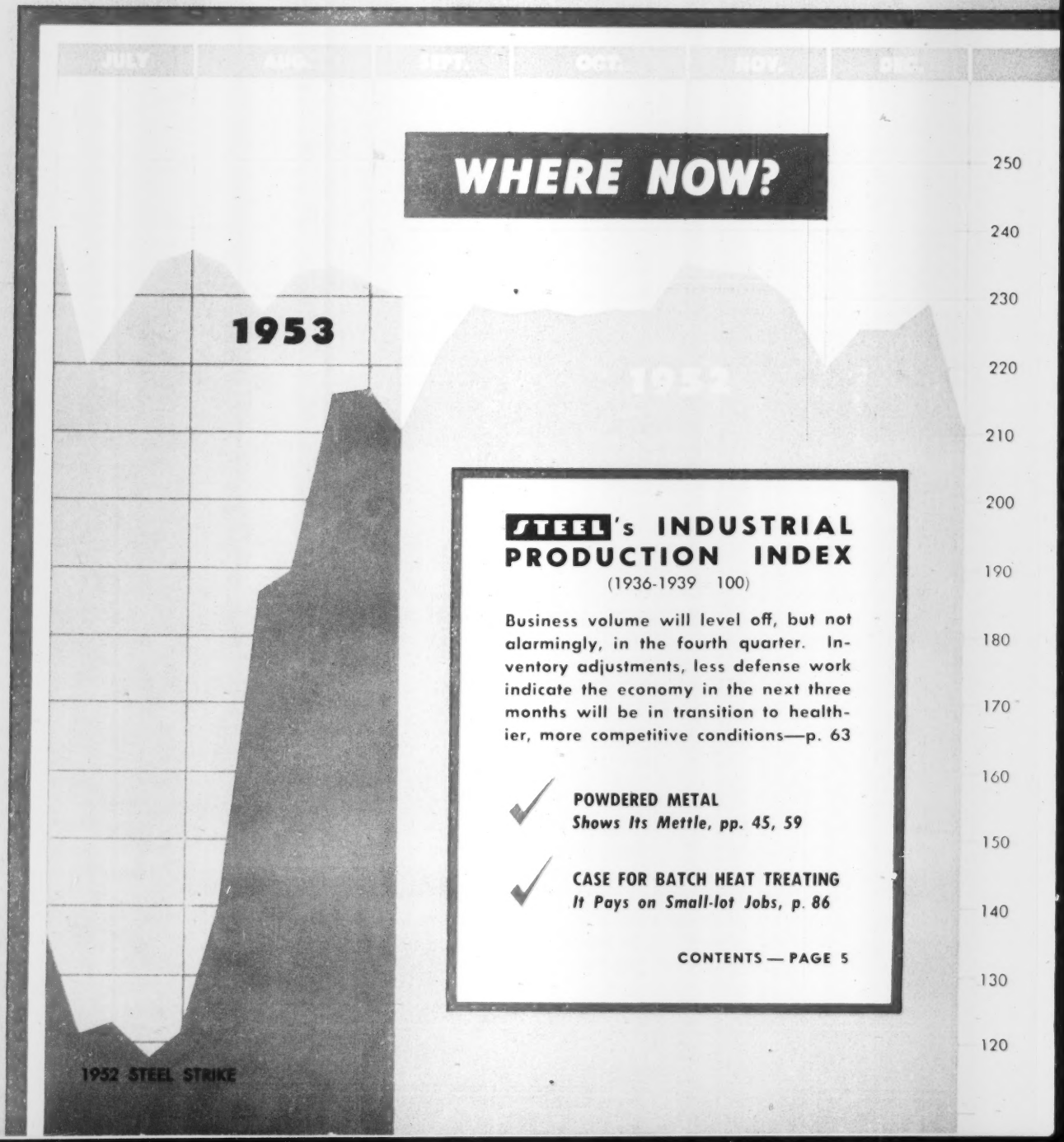
SEPTEMBER 28, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



WHERE NOW?

STEEL's INDUSTRIAL PRODUCTION INDEX
(1936-1939 100)

Business volume will level off, but not alarmingly, in the fourth quarter. Inventory adjustments, less defense work indicate the economy in the next three months will be in transition to healthier, more competitive conditions—p. 63

✓ **POWDERED METAL**
Shows Its Mettle, pp. 45, 59

✓ **CASE FOR BATCH HEAT TREATING**
It Pays on Small-lot Jobs, p. 86

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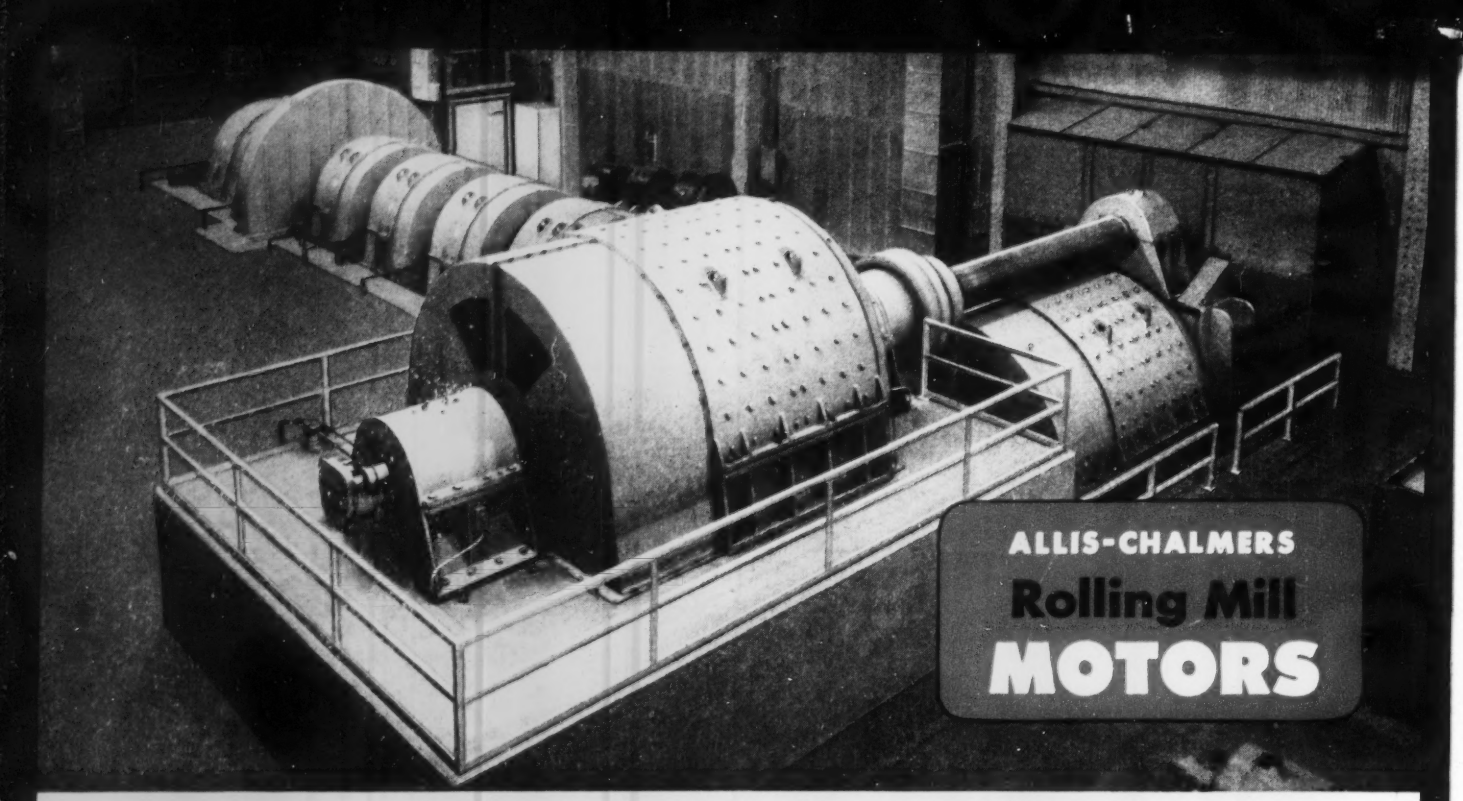


Shakedown Time ZERO!

Installation completed April 1. Production started April 2—at 200 tons an hour.

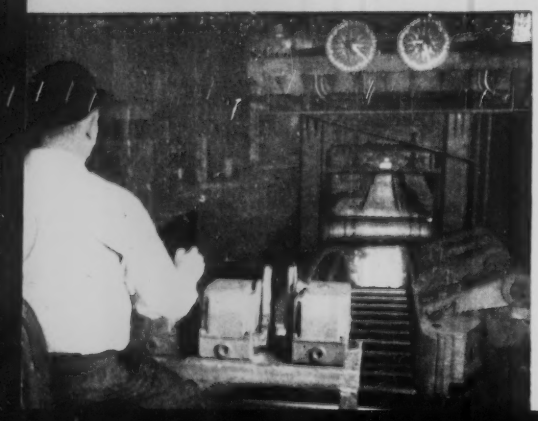
That's the story of the missing shakedown run at Granite City Steel Company's new 45 by 115-inch, two-high reversing blooming mill. (Eight days later the old blooming mill was torn out, since it was obvious that temporary standby equipment was not needed.)

All electrical equipment for this mill was supplied by Allis-Chalmers. Pictured above is the 10,000-hp, 40/80-rpm twin drive and supporting flywheel and excitation m-g sets. A-C is also furnishing the electrical equipment for a new roughing mill and for revamping a finishing mill.

Completion of their current $50,000,000 expansion program later this year will give Granite City Steel a capacity well over a million ingot tons a year.

To see how much A-C's wide experience with metal rolling applications can benefit you, call your nearest A-C steel mill representative, or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A 4100

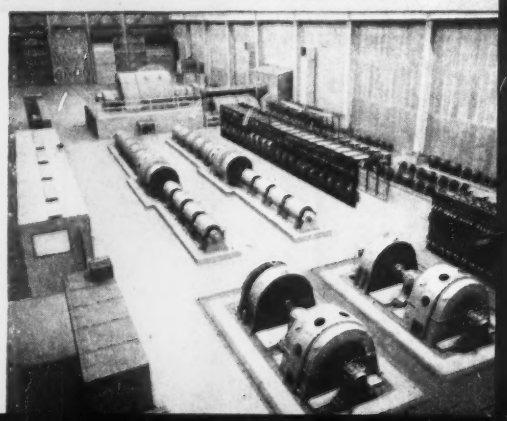
ALLIS-CHALMERS

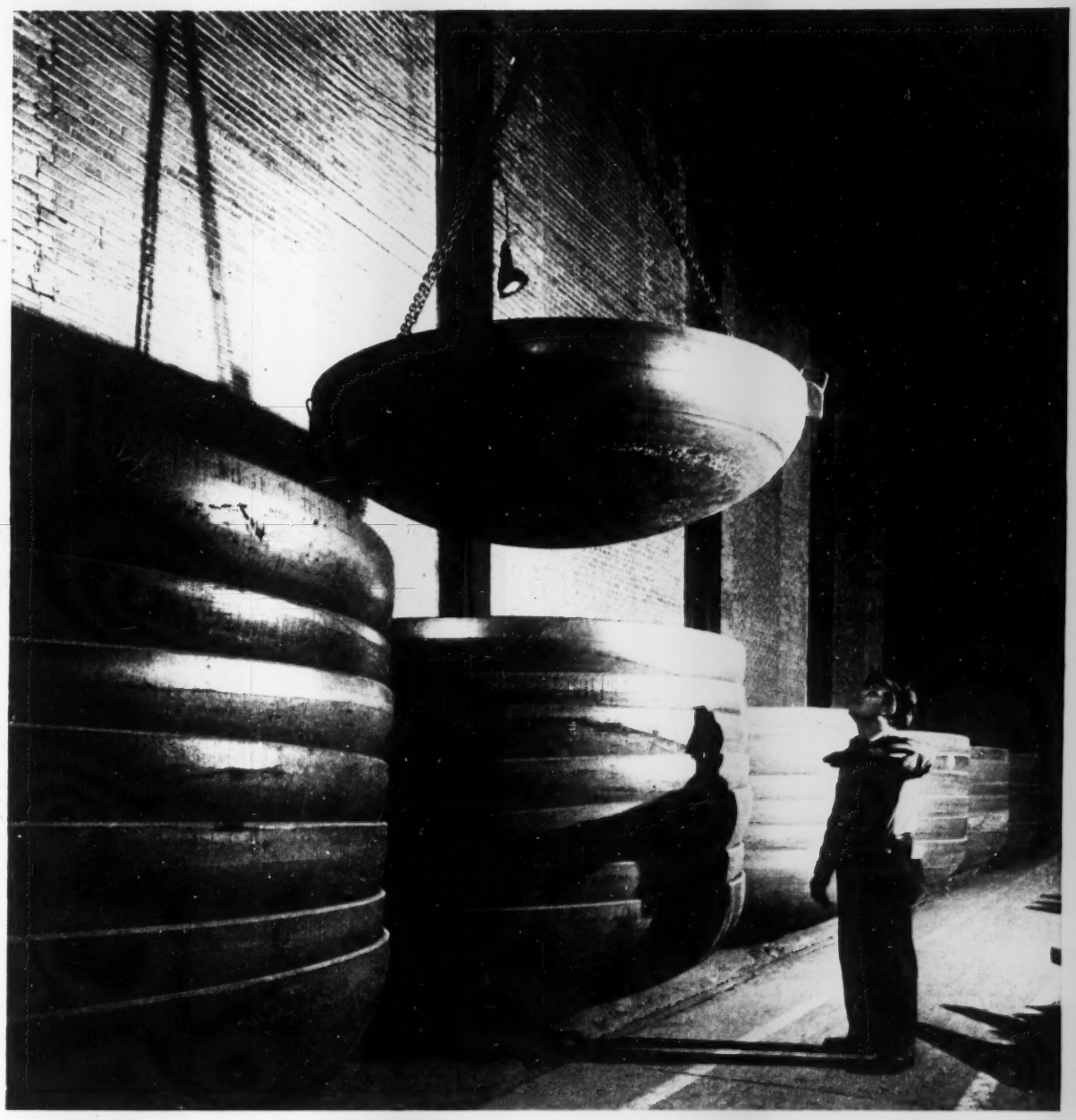


At left, Granite City Steel's new blooming mill viewed from the main pulpit.

Over-all view of motor room (right) shows ac control and switchgear at left; constant and variable voltage m-g sets in center; dc control panels and *Regulex* exciter sets at right; and the two 5000-hp twin-drive motors and m-g sets in background—all supplied by Allis-Chalmers.

Regulex is an Allis-Chalmers trademark.



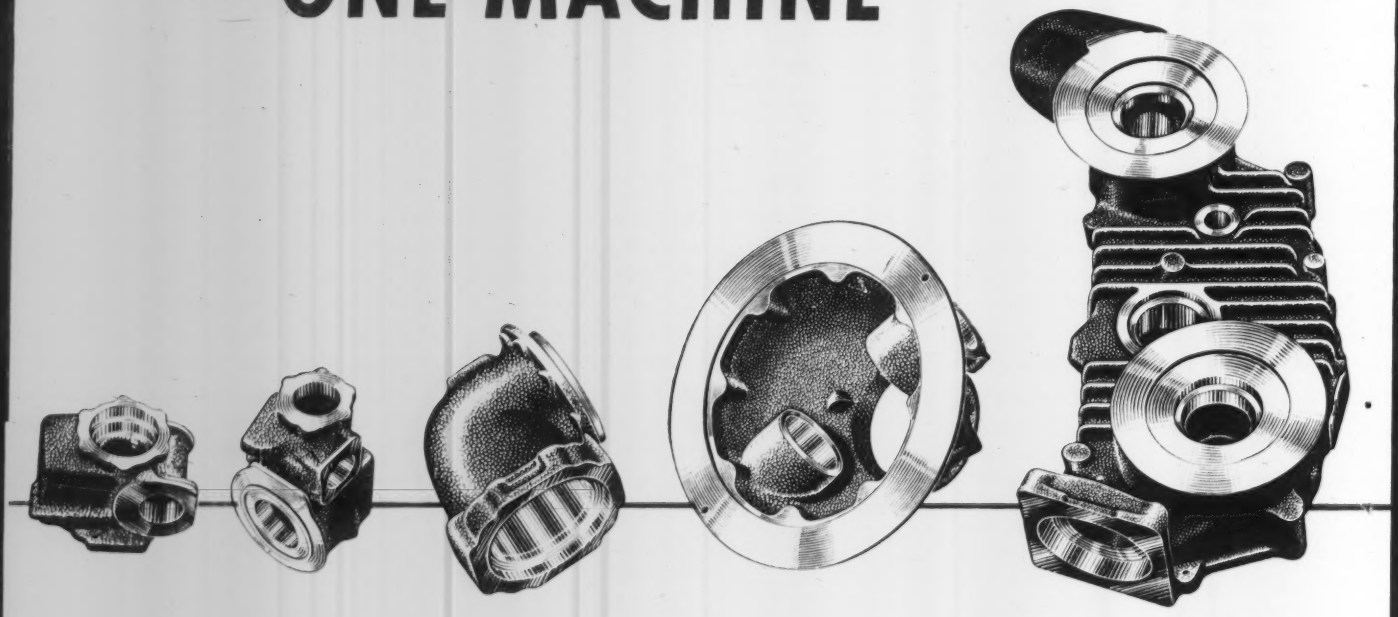


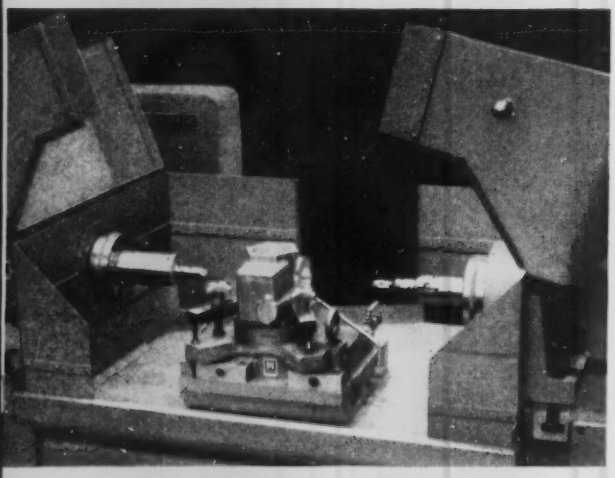
FLANGED-AND-DISHED HEADS MADE IN EIGHT TYPES By spinning and pressing, Bethlehem produces flanged-and-dished heads in these eight types: elliptical, tank car, obround-tank, flanged-only, double-dished, standard, shallow and ASME Code flanged-and-dished. Bethlehem Heads come in diameters up to 144 in., and in thicknesses from ⅛ in. to 3½ in. We also manufacture standard manholes and covers, hand holes and covers, flue holes, collar flanges and pipe flanges. If you would like to have full information, please write to us at Bethlehem, Pa., or to the sales office nearest you. Bethlehem Steel Company, Bethlehem, Pa.

BETHLEHEM STEEL

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

How to raise a **family of five** on ONE MACHINE





• On long-run production jobs, the speed, precision and economy of Heald Borizing has become almost a tradition. But what about short-run work on a variety of parts? Here, too, the versatile Heald Bore-Matic can give you faster, better production, at lower cost per part!

Here's a typical example. The Model 322 Bore-Matic shown at the left finishes FIVE different jet engine parts — each with a different fixture and tooling setup. Interchangeable fixtures are platen or angle plate type, as required. In some cases, adapters are used to permit one fixture to accommodate more than one part. Aligning rails help to locate the different fixtures quickly and easily. Both roughing or semifinishing and finishing are done with maximum speed and economy on this one Heald machine.

Long Runs or Short — when it comes to precision finishing, it pays to come Heald.

Internal and Rotary
Surface Grinding Machines
and Bore-Matics

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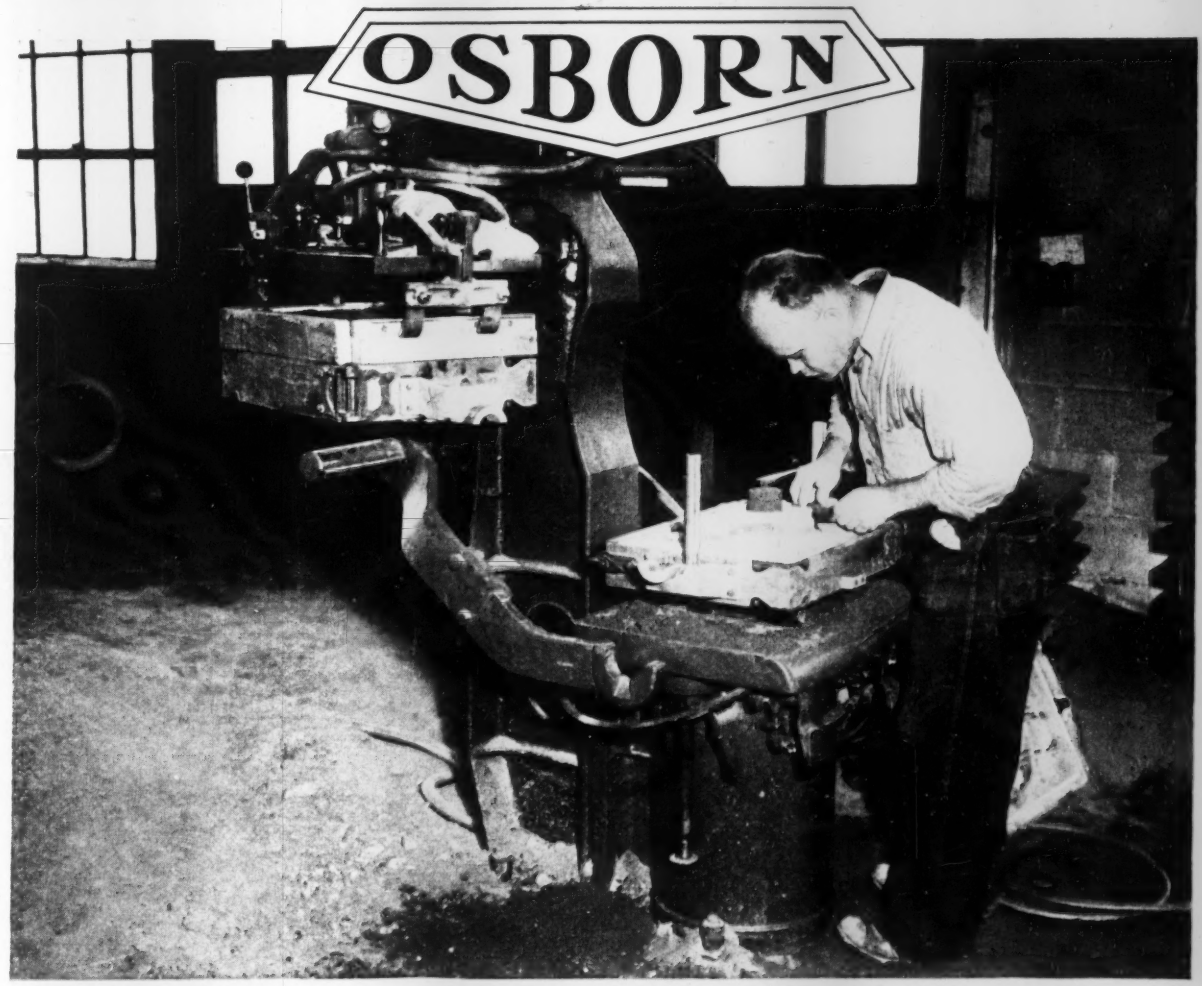

PRODUCTION STORY... 68 more molds a day per man that can cut your foundry costs

Former Method: Best production ... only 32 complete molds a day per man. Weight and size of molds required one man and one machine for copes alone . . . another man and another machine for drags.

Present Osborn Rota-Lift Method: Production . . . 100 complete molds a day per man, 68 more per day than before. Now one man using one machine, an Osborn Rota-Lift, *makes both copes and drags.* The molds are more accurate, more uniform . . . cost less to produce.

Results like these with Rota-Lift using match plate patterns are typical in foundries throughout the country that have mechanized their molding operations with Osborn machines. And the results can be duplicated in your plant.

By eliminating heavy manual effort, Osborn machines utilize the molder's skill to peak advantage in the production of quality molds. Many Osborn machines are also equipped with automatic controls to turn out complete molds on preset time cycles. This means peak efficiency . . . lowest cost per mold.

Take advantage of Osborn's latest molding techniques developed to conserve molding man-hours and cut foundry costs. An Osborn factory-trained molding specialist will gladly survey your needs and show you how. Call or write *The Osborn Manufacturing Company, Dept. EE-10, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

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Osborn Molding Machines

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Eaton Permanent Mold Gray Iron Castings—

for

POWER STEERING

Send for your free copy of the 32-page illustrated booklet: "The Eaton Permanent Mold Foundry." It tells the story of Permanent Mold Castings and takes you on a picture-tour of the Eaton Foundry at Vassar, Michigan.

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This Week in Metalworking

STEEL

Vol. 133 No. 13 September 28, 1953

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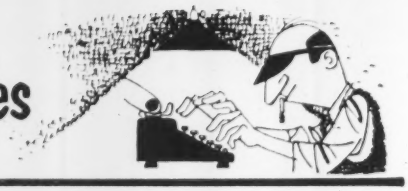
behind the scenes



Gentlemen Be Seated!

The paper mill is jumping these days to the staccato jangling of tambourines . . . the riotous bromides of blackfaced endmen . . . and the snappy gyrations of a glamorous chorus line.

Sixty-strong, the Penton Players are answering rehearsal calls twice each week as their calousy, strewpendious, jugantic Minstrel Show makes ready for opening night just October 29th away.

Script, songs, choreography, costumes, scenery are all the handiwork of Penton personnel as stenographer, editor, artist, clerk, printer, salesman and elevator operator combine hidden talents and get a little of the "ham" out of their systems.

The production is being staged for Penton folk and friends. If you should happen to be in the neighborhood come October 29 or 30, drop in at the paper mill and join in the fun.

Cryptographically Yours

We've been getting the long and pointed needle all week over our lentil reproduction job of September 6. Seems we got a bit elementary with that one.

Sorry, fellas! It won't happen again. It was the first puzzler in months that we've been able to figure out ourselves. Guess we just lost our heads.

Now, with the help of Mr. J. Poulain of the Europam Corporation Limited of Montreal, we're going to reap a sadistic revenge. Here's a bit of cryptographical confusion we dare you to unscramble:

Bill is vacationing in France and spends a lot more money than he expected he would. He must cable home for more money but he doesn't want Mrs. Bill to know how much he needs. He works out a coded message reading "SEND MORE MONEY". Upon receiving the wire his wife, puzzled over the message, takes it to their banker friend. The banker studies the message and after a while says, "I know exactly how much money Bill requires. I'll send it to him immediately."

Now, *Mrs Amis*, you tell Mr. Poulain (a native Parisian) and us just how much money the banker sent Bill.

Correct Answerers

August 24th—*The Doggie Puzzle*: D. F. Davis who threatened to take his doggie and go home if we didn't tess up to that fact that he had the right answer as early as August 26; also Bernard A. Foley.

August 31st—*The Marital Problem*: Arthur G. Aro, Donald R. Shere, H. L. Lusted and J. Poulain.

September 6th—*The Lentil Job*: H. E. McCray, Dale D. Lynch, A. J. Havlicek, P. R. Izdepski, Peggy Keirn (our column's getting more glamour each week), and old reliables H. R. Boyer, L. D. Rice and William W. Johnson.

Smell Appeal

We were reading in a copy of *Postage Stamp* the other day that a new and frightening advertising medium has been experimented with in Paris.

A couple of perfume manufacturers seeded cumulus clouds with a mixture of dry ice and their Black Satin perfume. Result: a fragrant rainfall that Black Satanized all of Paris.

The medium is a natural for the perfume and cosmetic people. We can see some interesting variations on the theme by distillers and wine makers but what are the applications for manufacturers of metal products?

This could be the beginning of an entire new process called metal smelling. Perhaps attractive odors of various types could be worked into the finish of consumer products so as to make them more desirable. We can see the advertising slogans now.

OUR refrigerator smells fresher . . . or, Use OUR typewriter, your copy will smell like it never did before . . . or, OUR kitchenware has that built-in smell good flavor.

Shrdlu

(Metalworking Outlook—Page 37).

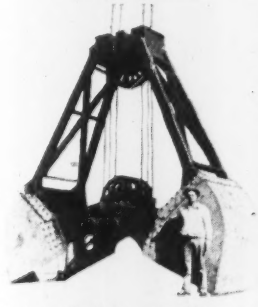
Wellman will build it

Special Cranes
Ore Bridges
Gas Producer Plants
Charging Machines
Forging Manipulators
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Skip Hoists
Clamshell Buckets

Wellman ore and coal handling bridges

give fast and efficient operation

One of two 6-ton Coal Handling Bridges in this installation.



6-ton Wellman Williams Type Coal Bucket used with these bridges.

● Take advantage of Wellman's long experience in designing and building handling bridges of many types and capacities. Your selection from the complete line will provide fast and efficient handling of coal or ore. Wellman equipment, in service the world over, is recognized for its long life and dependable service. It is backed by more than half a century of engineering experience.

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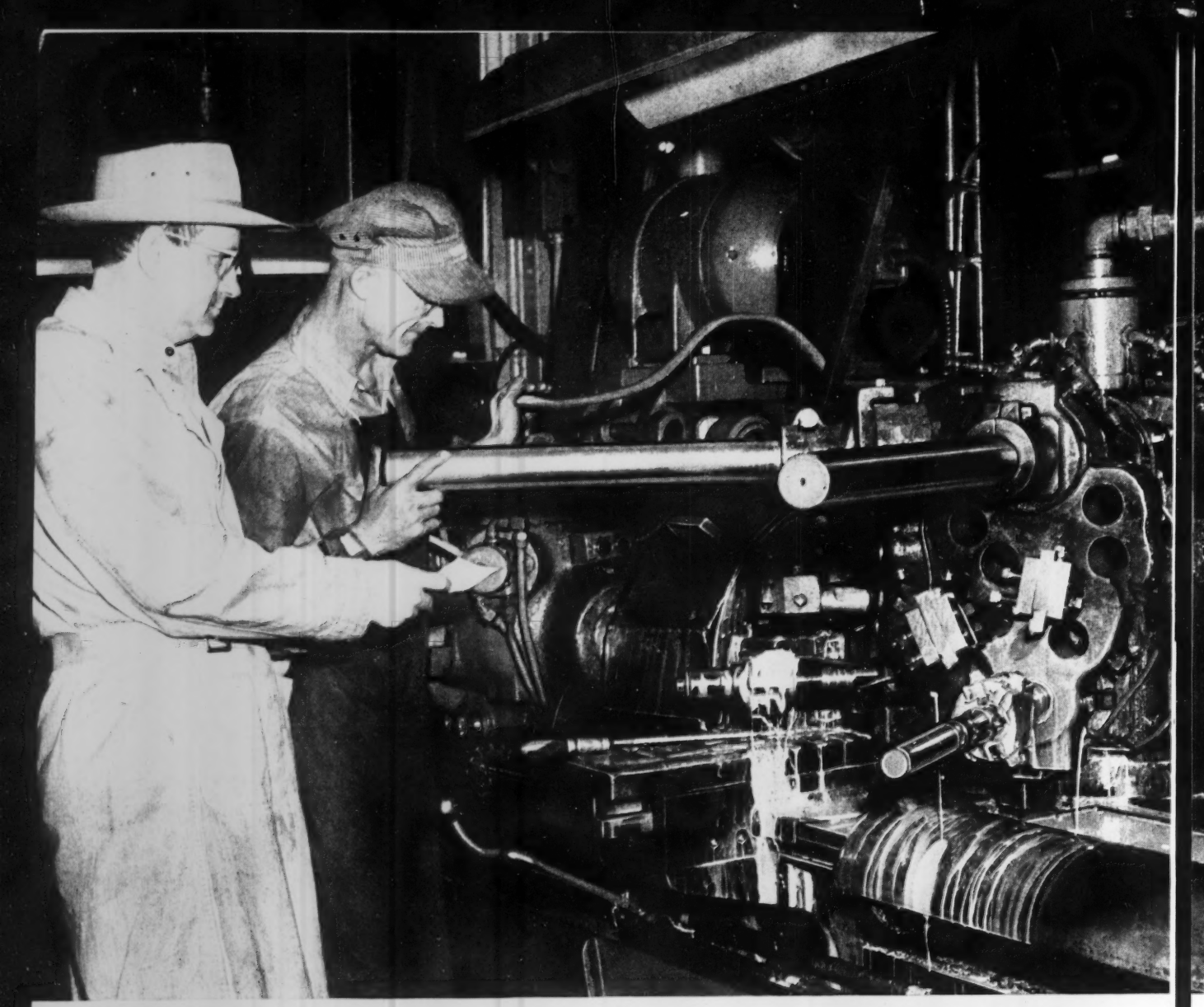


The Four Wheel Drive Auto Co. benefits 4 ways with

SUPERLA
REG. U. S. PAT. OFF.
Soluble Oil

• Over a period of nearly 40 years, the Four Wheel Drive Auto Co., Clintonville, Wisconsin, has used SUPERLA Soluble Oil on an increasing variety of machining jobs. Shown above is a current operation performed on a semi-automatic turret lathe. The job calls for boring and turning of 1040 steel to produce differential case assemblies.

Company officials report that on this job, as on many other jobs employing milling machines, drill presses, and grinding machines, SUPERLA Soluble Oil has provided these four important benefits: **1.** Mixes readily with cold water. **2.** Forms stable emulsions. **3.** Helps hold close clearances and dimensions. **4.** Helps provide good finish and tool life.

The long and successful experience of the Four Wheel Drive Auto Co. with SUPERLA Soluble Oil testifies to the benefits you can obtain with this outstanding coolant.

The Standard Oil lubrication specialist serving your area of the Midwest has a complete line of metalworking fluids and compounds to offer you. He also has the experience and training to help you use these products most effectively. You can reach this man by phoning your local Standard Oil (Ind.) office. Or write: Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Illinois.

What's YOUR problem?

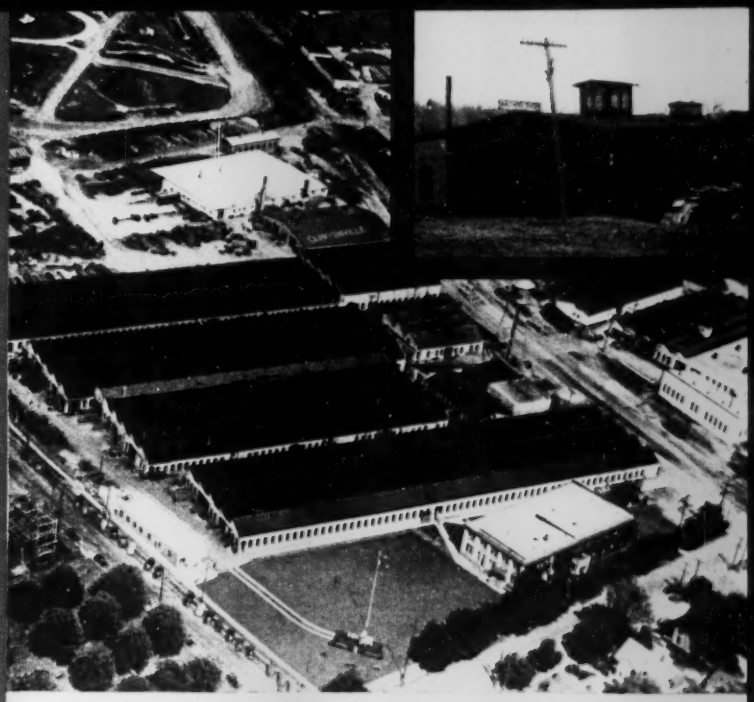
R. E. O'Brien, of Standard Oil's Green Bay office, is the lubrication specialist who works closely with the Four Wheel Drive Auto Co. to assure maximum benefits from the use of SUPERLA Soluble Oil.

He is one of many lubrication specialists who make their headquarters in Standard's offices throughout the Midwest. These men have been specially trained in Standard's Lubrication Engineering Schools and, in addition, have a wealth of on-the-job experience. The specialist nearest your plant is ready to give prompt, expert and thorough attention to your lubrication problems.

A phone call to your local Standard Oil Company office will bring this man quickly to your plant—with no obligation to you, of course.

STANDARD

STANDARD OIL COMPANY
(INDIANA)



Nothing succeeds like service!

These illustrations, contrasting the past with the present, show dramatically the progress made by the Four Wheel Drive Auto Company since its organization in 1910. Service to the nation, through two world wars and in an era of great growth and progress, has won an impressive success for this company. Service, too, has won for Standard Oil an acceptance by the Four Wheel Drive Auto Company that now extends over a period of nearly 40 years.

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LETTERS TO THE EDITORS

Pro, Con on Apprentice Training

As public relations counsel for the National Tool & Die Manufacturers Association, we are particularly interested in the excellent lead article "Where Are the Apprentices?" (Aug. 31, p. 29).

The NTDMA is in complete agreement that "the whole problem demands aggressive and co-operative action by industry . . . " and is taking positive action in regard to expanding tool and die maker apprenticeship (See STEEL, Sept. 21, p. 97).

The association realizes, of course, that it is not enough to merely attract likely apprentices. It is launching a concentrated campaign among its more than 800 member shops to expand training facilities wherever possible.

Fred Wittner
Fred Wittner Advertising
New York

I've enjoyed your magazine so much for so many years that I was tremendously shocked to read such a poor article as "Where Are the Apprentices?" in the Aug. 31 issue. The question is so very important that it deserves a much better answer than just a rewrite of information furnished by a federal bureau.

The blame for our current shortage of apprentices rests mostly on industry, the labor unions and the Federal Bureau of Apprenticeship, but other government agencies, our schools and parents are contributing factors.

You would be performing a real service to the metalworking industry—to all industry in fact—if you wrote a good article on the subject. It would take a lot of digging and when the answers were put together you'd probably offend everyone, but facts are facts. The problem is such an important one that it deserves an honest, if painful, answer.

K. A. Moody
training director
American Steel & Wire Division
U. S. Steel Corp.
Cleveland

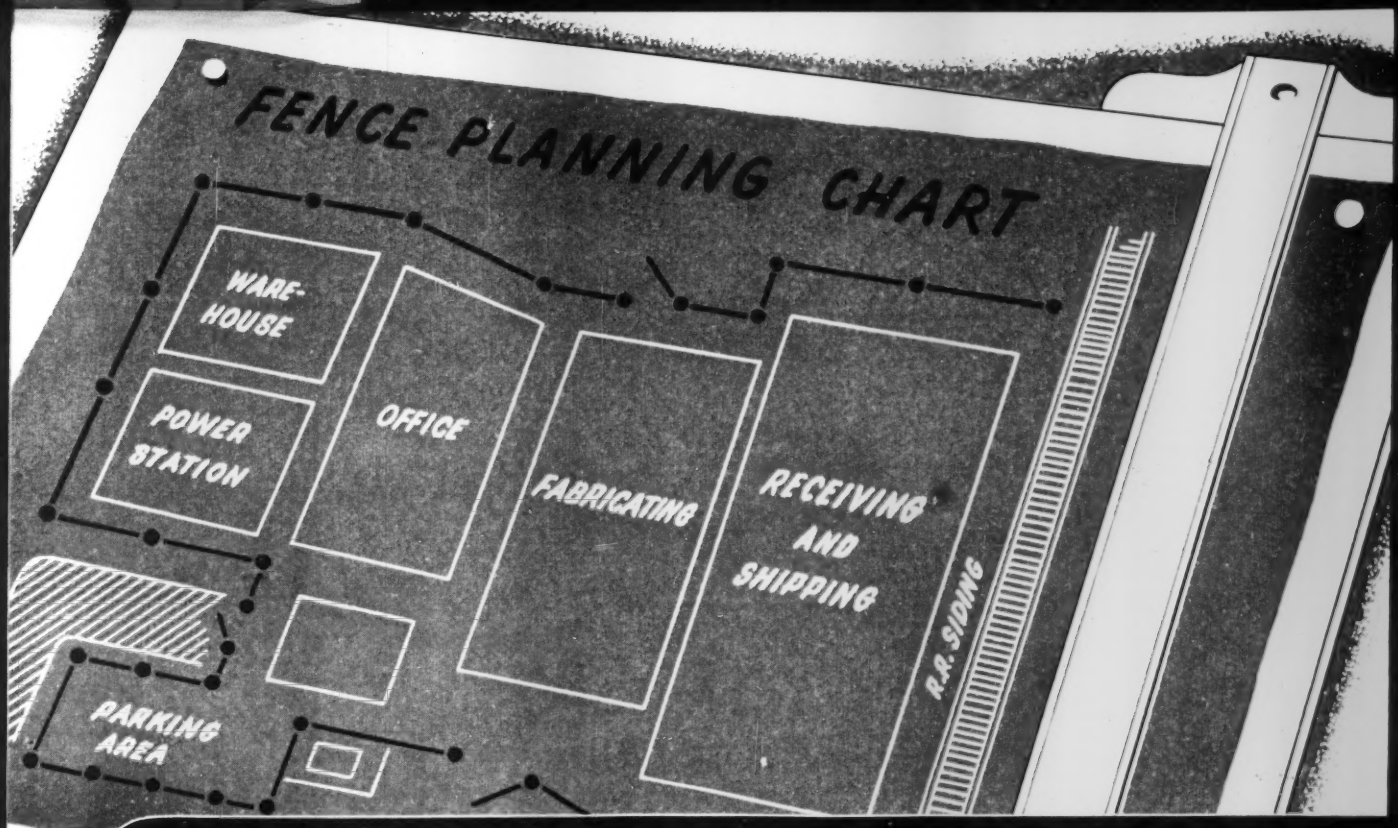
• *We agree that the question is important. We checked with a number of training directors around the country, and our story is based on their replies, not on government releases. The Aug. 31 article attempted to tell the general management man, who is not specializing in training, about the gravity of the situation. Perhaps, now we can delve more deeply into the subject.—ED.*

Noncontrolled Circulation

We appreciated very much the extra reprints that you furnished us of the fine article "Distribution Outmoded?" (Aug. 3, p. 57).

We furnished some of those reprints

Please turn to page 12



How *CONTINENTAL Fence Engineers Solve Property Protection Problems

● *You can be sure* you'll get extra value property protection . . . extra years of useful fence life with Continental Chain Link Fence. That's because Continental fence engineers plan and lay out fence to anticipate future plant growth and department expansion. This avoids needless expense of relocating or adding fence later. And Continental watches for fence material economies . . . employing money-saving methods to reduce total fence footage needed. You'll want to start now *to make sure*, so mail coupon for free "Planned Protection" booklet. Our representative is anxious to show you how to get extra years of solid plant security . . . how to have just the fence you need—at lower cost per year of fence life. You'll be glad you talked with Continental.

*Tr. Mrk. Reg. U. S. Pat. Off.

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Kokomo, Indiana

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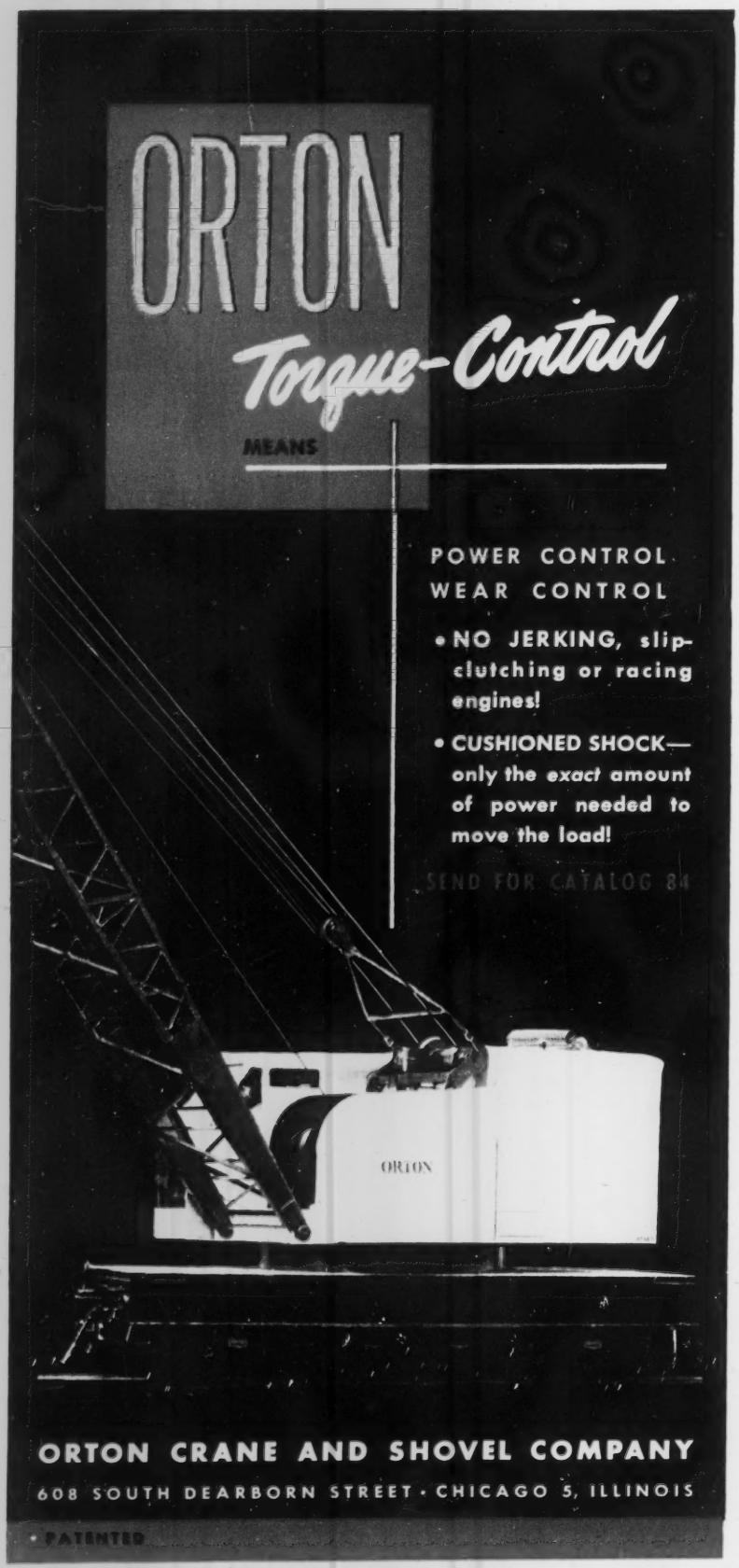


LETTERS

Concluded from page 10

to our Washington office for distribution by them to top personnel in Washington and to our field offices.

We have also furnished copies to the principal chambers of commerce throughout our district calling their attention to the article and to the fact that this reprint was furnished by STEEL.

George A. Moore
regional director
Bureau of Foreign & Domestic Commerce
U. S. Department of Commerce
Cleveland

Die Castings Shape Future

I am very much interested in your article "Die Castings—Mold Shape of Things to Come" (July 6, p. 106). I wonder if it would be possible for me to secure several reprints of this article as I have several friends very much interested in this field.

I would like to mention that as a subscriber, I am more than pleased with the fine publication for which you people are responsible.

A. J. McConnell
Crucible Steel Co. of America
Baltimore

• *Tearsheets are sent.—ED.*

Tool Guide Still Popular

Your special report "Guide for Selecting Tool Steels & Carbides" (June 16, opp. p. 106) has proved especially valuable. May we have another copy for use in our engineering and purchasing functions.

G. C. Wilhide Jr.
purchasing department
Black & Decker Mfg. Co.
Towson, Md.

• *Sent.—ED.*

Article Serves as Criteria

Please send me 5 copies of the article "Watch Out for Incentive Snares" by M. K. Sheppard (June 15, p. 59). It will serve as effective criteria for judging a special set-up incentive plan now under consideration.

Robert Schindler
training director
Globe-Union Inc.
Milwaukee

• *Sent.—ED.*

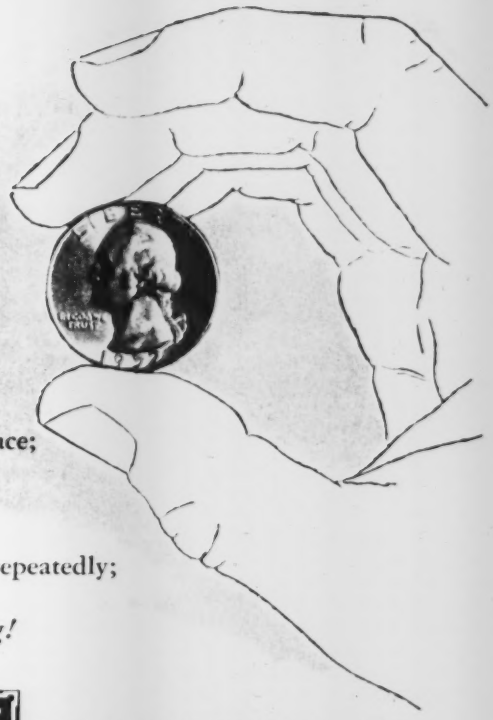
Looking Forward

As a new subscriber let me say that from the first glance it would appear that STEEL is going to be of very real benefit and I shall look forward to receipt of my regular copies with much interest.

J. Walter Harper
general manager
Pretoria Metal Industries Ltd.
Pretoria, Union of South Africa

here's a test you can make

with a quarter

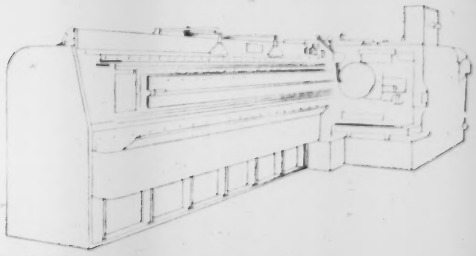


- Stand a quarter on edge directly over the spot where the BROACHING is taking place;
- remove all the required metal on a TURBINE DISC; go through the automatic cycling — repeatedly;
- *your quarter will still be standing!*

on this new **LAPOINTE** ELECTRO-MECHANICAL DRIVE horizontal

BROACHING MACHINE

We eliminated vibration by the very weight and massiveness of this machine! Constant chatter or vibration at the cutting edge of any tool will materially shorten the life of the tool. *Eliminate vibration and you multiply the life . . . six times . . . eight . . . or even ten times!*



Strokes of 100" to 180", and broaching speeds up to 300 fpm — and more — are available on this amazing new LAPOINTE machine. Complete details are given in our Technical Bulletin, sent promptly on request.

Ask for Bulletin S·R·H·E — 3

LAPOINTE

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

ENDURO *Brightwork*

HELPS KEEP COIN SLOTS BUSY

To sell—*and keep on selling*—beverage dispensers are placed in high traffic locations, often fully exposed to weather.

Still, they should sparkle quality—inspire confidence—to attract thirsty "prospects." Just as important, they must stand up under rough usage.

That's why Mundean Manufacturing Company, Columbus, Ohio, who made this beverage merchandiser, uses ENDURO Stainless Steel for tops and trim. Judging from nationwide performance reports, ENDURO brightwork will help keep the coin slots busy for years to come!

Tough ENDURO *retains* its distinctive luster—resists rust and corrosion—resists abrasions and dents—requires little maintenance. Its hard, smooth surface is easy to clean and keep clean, *always*. Naturally, there's no plating to wear or peel.

Chances are, ENDURO Stainless Steel can *scintillate* the eye-appeal and *buy-appeal* of your products . . . at the same time, increase their wearability—their life span. Why not talk over the possibilities with Republic metallurgists? There's no obligation, of course. Just write.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

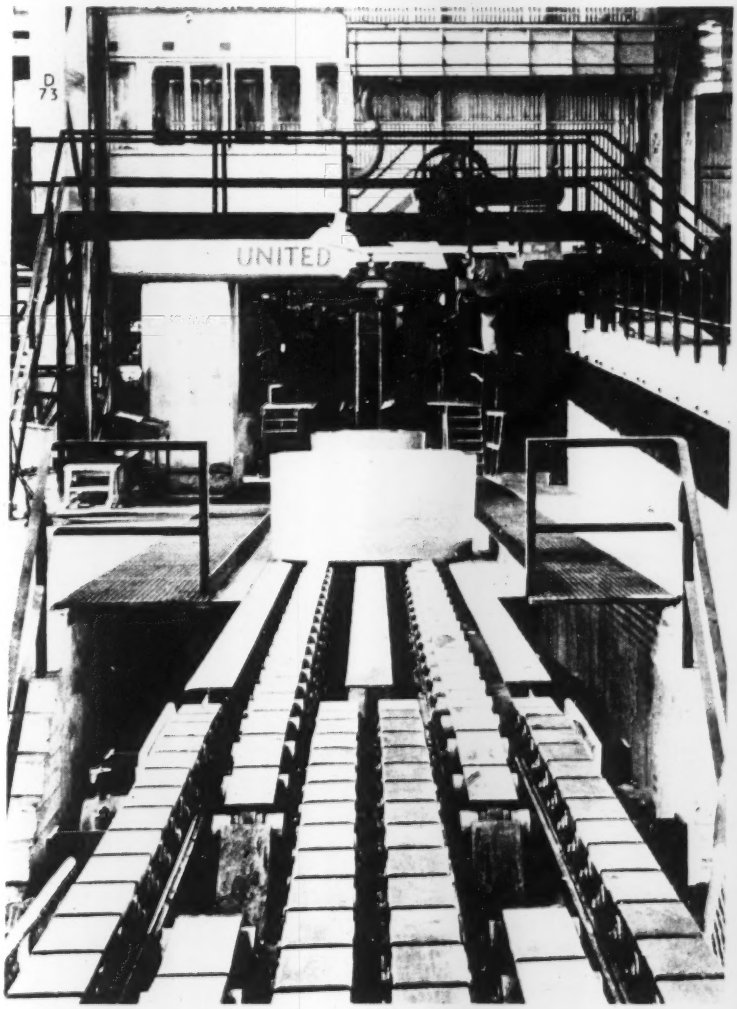
Republic

REPUBLIC STEEL

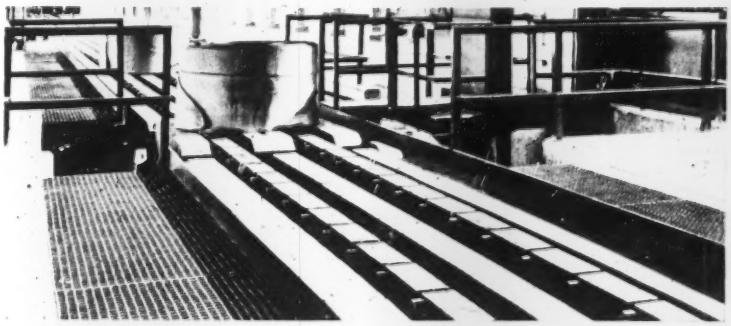
ENDURO® STAINLESS STEEL

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

Newest British continuous strip mill moves coils on LINK-BELT conveyors



Transfer point on Link-Belt double-strand roller chain conveyor from the coiler. Up to 30,000-lb. coils are cooled as they move to storage.



Coils are lifted from conveyor for automatic weight recording. Entire system is synchronized and under full control of pulpit operators.

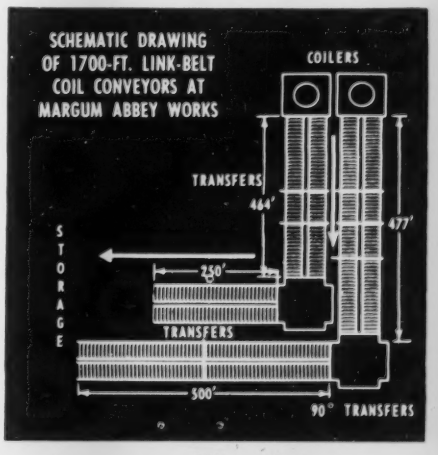
Up to 30,000-lb. coils are carried safely, gently from coilers to storage

RANKING in efficiency with the most modern mills is the new Margum Abbey Works of the Steel Company of Wales on Swansea Bay. To build it, four principal British steel producing companies pooled their resources.

For transporting coils from the coilers to storage, Link-Belt furnished conveying, weighing and transfer equipment through United Engineering & Foundry Co., Pittsburgh. As can be seen from the diagram below, movement is accomplished without the use of overhead cranes or lift trucks. This means not only greater capacity but also improved safety.

What's more, gentle handling increases yield. Waste goes down because there's no scuffing of edges, no telescoping of coils.

Link-Belt builds coil handling conveyors to meet widely varying physical and economic requirements. Our engineers will work with your own engineers, consultants and builders of mill and process equipment — help you select the right system for your exact needs.



LINK-BELT

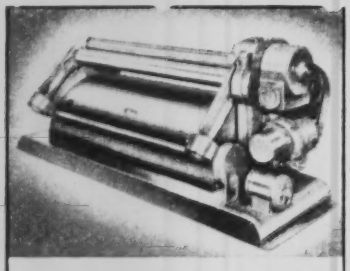
MATERIALS HANDLING, PROCESSING & POWER TRANSMISSION EQUIPMENT

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle; Scarboro, Toronto and Elmira, Ont. (Canada); Springs (South Africa); Sydney (Australia). Sales Offices in Principal Cities. 13 318

REED
ENGINEERING CO.

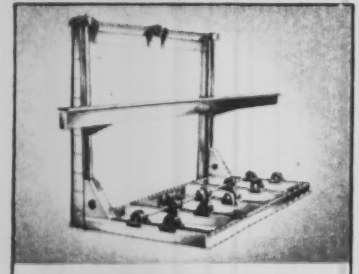
Modern
Metalworking
Equipment

- BENDING ROLLS
- TURNING ROLLS
- AUTOMATIC WELDING FIXTURES



REED PLATE BENDING ROLLS

- ★ In 18 models, ranging from 3 ft. x 10 ga. to 8 ft. x ¼" in capacity
- ★ Rugged, all steel construction
- ★ Built-in, silent worm gear drive
- ★ Durable, special bronze bearings
- ★ Power adjustment & air drop end available on most models



UNIT TYPE AUTOMATIC WELDING TURNING ROLLS

- ★ Combines adjustable track support and turning rolls into one fixture
- ★ In 5 standard models
- ★ Capacities up to 9 tons, 12 ft. diameters
- ★ Vertical and horizontal powered track adjustment on larger models

WE INVITE YOU . . .
to write us for specifications, prices, list of REED users near you. No obligation. Just write on your letterhead.

REED ENGINEERING CO.
1005 W. FAIRVIEW, CARTHAGE, MISSOURI

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The Weekly Magazine of Metalworking

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Warehouse Delivery – Mill Prices!

Full Facilities For:

- Shearing sheet stock up to $\frac{3}{8}$" thick
- Slitting coils up to 48" wide to your specifications
- Decoiling and leveling steel in gauges from .050 to .187 — widths to 52"
- Supplying sheet and strip steel in all finishes, tempers

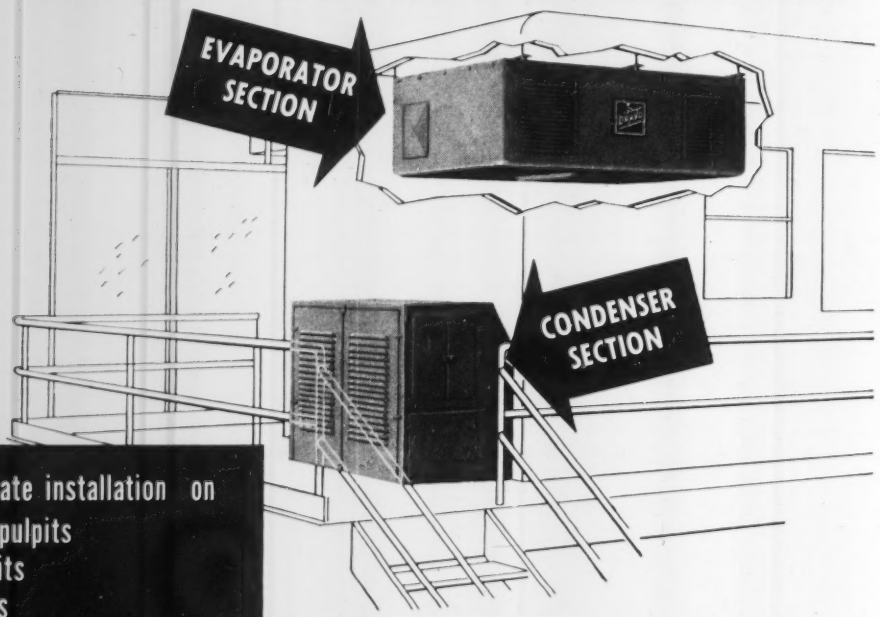
NEW ENGLAND'S LARGEST STEEL WAREHOUSE, suppliers of the highest grade flat rolled steel to New England, New York and New Jersey, is prepared to fill your orders, now, for .008 to .015, gauge tolerances + or — .0005 . . . supplied in coils for your high speed presses. Extremely close gauge tolerances give you more parts per ton, cut down on production costs and give your dies longer life.

Dolan Steel also has available *electrolytic tin plate* in the above gauges and gauge tolerances, slit to your exact specifications in tempers and coil weights desired.

DOLAN *Steel Company Inc.*

810 UNION AVE. BRIDGEPORT 7, CONN. PHONE 5-8173

Announcing...
The NEW DRAVO
PULPIT AIR CONDITIONER



. . . available for immediate installation on
- **blooming mill pulpits**
- **strip mill pulpits**
- **rod mill pulpits**

and other steel mill control locations where heat, dirt and fumes create working hazards

The new Dravo Pulpit Air Conditioner—latest addition to Dravo's complete line of industrial air conditioning units—is especially built for pulpit installations. The evaporator section is floor- or ceiling-mounted inside the pulpit along with a suitable cabinet which contains all controls. The condenser section is located adjacent to the pulpit wherever convenient. The two sections are joined by refrigerant piping. Either water or air can be used as the refrigerant.

Thermostatic Control for Year-around Air Conditioning

The Dravo Pulpit Air Conditioner is thermostatically controlled to maintain 80° to 85° F temperature in the pulpit in summer when ambient temperature is 175° F; and 68° to 72° F in winter with an ambient temperature of 0° F.

The Pulpit Air Conditioner filters the air, removes dust, dirt, fumes and gases; heats the pulpit in winter, cools it in summer and provides year-around ventilation. It protects pulpit operators' health, makes them more comfortable and efficient and enables them to work longer periods of time.

Easy Installation, Long Service Life

The Dravo Pulpit Air Conditioner can be easily installed by Dravo personnel without interruption of work operations. Each unit is factory-assembled, pre-tested and is ruggedly constructed for years of service. All parts are readily accessible for easy maintenance.

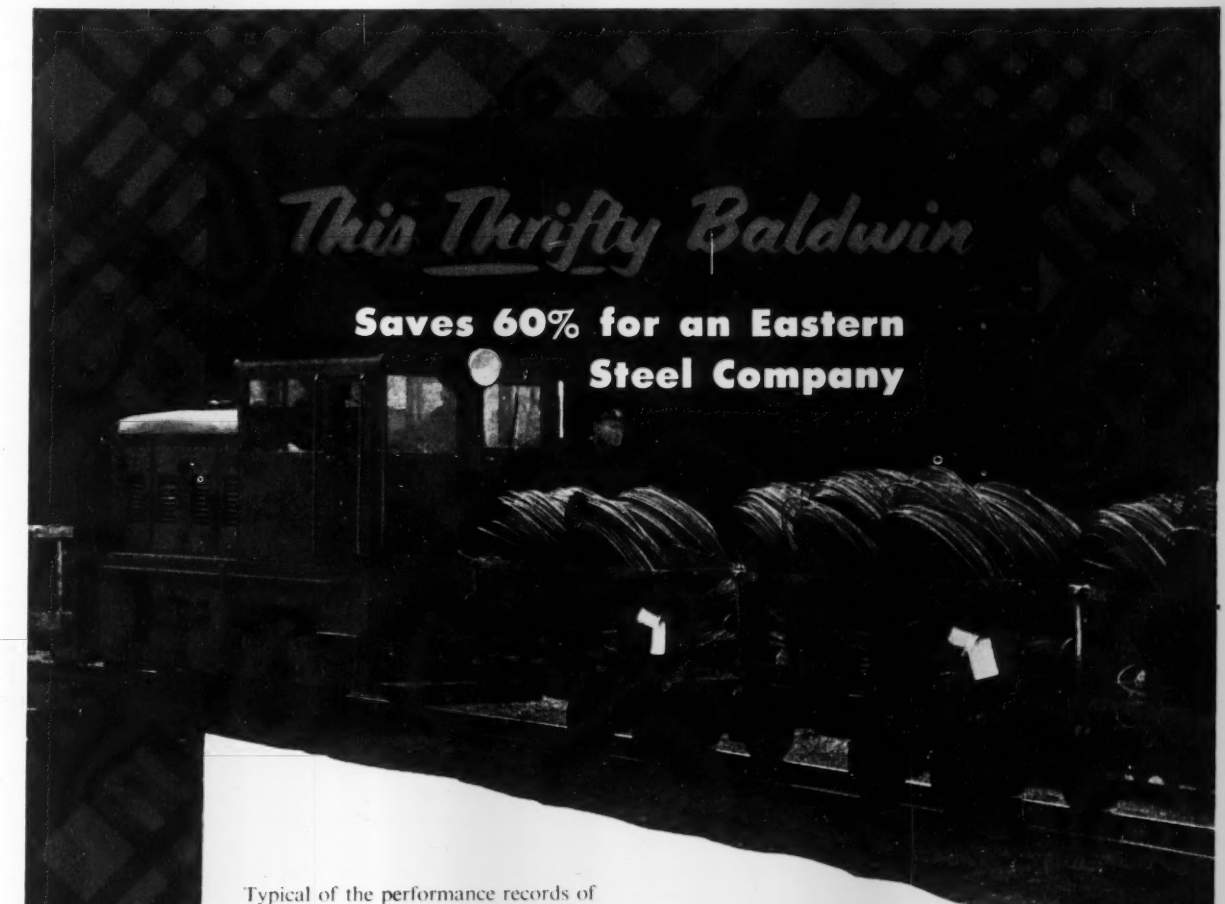
Write Today for Complete Information

Get the full story on Dravo's Pulpit Air Conditioner. Write—or phone—the nearest Dravo Office and ask our representative to call.

DRAVO CORPORATION

Air Conditioning Department
Fifth and Liberty Avenues, Pittsburgh 22, Penna.

Atlanta • Boston • Chicago • Cincinnati • Cleveland • Detroit • Indianapolis • New York • Philadelphia • Pittsburgh • St. Louis • Washington



This Thrifty Baldwin

Saves 60% for an Eastern Steel Company

Typical of the performance records of thrifty Baldwin industrial locomotives is a report from an eastern steel company, where a Baldwin diesel switcher is employed in materials handling averaging 120 tons a load.

"We can take in *one* trip, materials that previously may have required 2 to 3 trips to transport from one part of our plant to another."

This represents a saving in materials handling costs of approximately 60% by using a Baldwin diesel to do the job.

This steel company also reports: "Maintenance has not been a problem."

"From the standpoint of handling ease, the diesel locomotive is safer and easier to operate."

Because Baldwin industrial locomotives are thrifty . . . representing more economical materials handling, lower maintenance, greater operating flexibility . . . they can check mounting haulage costs in your plant.

If *you* are interested in more economical switching operations, write today for Bulletin DMH-300 to:

Dept. 1646, Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

BALDWIN · BLH · LIMA-HAMILTON

BALDWIN-LIMA-HAMILTON

INDUSTRIAL LOCOMOTIVES

...they're thrifty!

GENERAL-PURPOSE CONTROL

Flip motor starter

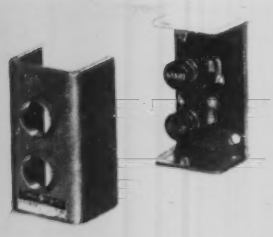
1 - 7½ hp manual motor starters

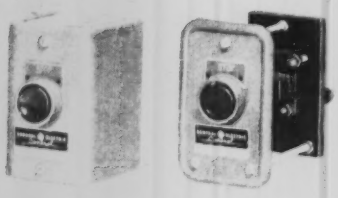
A-c magnetic motor starter

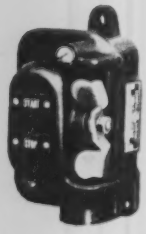
Combination motor starter

Reversing motor starter

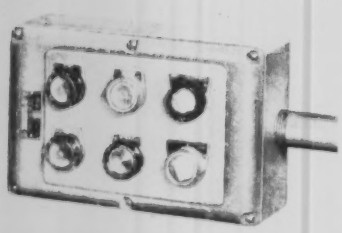
Choose from G.E.'s complete line of push buttons


Standard-duty station, cover removed


Heavy-duty, for wall or flush mounting


Standard-duty watertight station

Standard-duty explosion-proof enclosure


Oiltight station mounted horizontally

General Electric push button installation at Oklahoma Publishing Company. Mounted on this newspaper press are eight heavy-duty stations of two units each together with a six unit oiltight station.

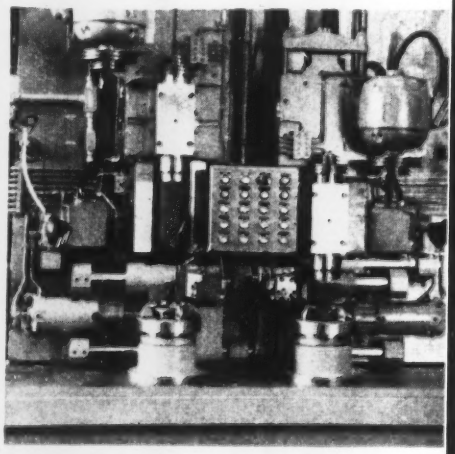
You'll find the right push-button unit or station for your particular application when you select a dependable G-E control accessory. All units have a continuous rating of 10 amps for all voltages.

THREE BASIC TYPES

Standard-duty for average applications. Enclosures include general-purpose, dust-tight, watertight, and explosion-proof. Over-all rugged construction includes fine silver double-break contacts which make contact maintenance virtually unnecessary. And wiring is easy front-connected terminals, ample space speed installation. For further details, write for Bulletin GEA-3469C.

Heavy-duty designed to withstand the roughest industrial use. Contacts are heavier than in standard-duty forms; enclosures are heavier gage steel. Designed for maximum flexibility to provide for requirements which cannot be accommodated in standard-duty line. Forms are available with selector switches, indicating lights and maintained contact buttons. Forms for palm or foot operation are also available. Bulletin GEA-5043A gives complete details on these stations.

Oiltight adapted to machine tool service or where oil or coolant is present. All stations meet JIC specifications in every detail. Strong, lightweight, cast aluminum enclosures are designed for convenient wiring. The units install easily and a specially designed washer keeps the units oiltight with normal hand tightening. Bulletin GEA-5779A gives ratings and complete information.


Twenty-unit G-E oiltight station on special hydraulic-actuated duplex machine built by Snyder Tool and Engineering Co., Detroit

INFORMATION FOR PRODUCTION AND MAINTENANCE

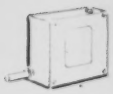
Reduced voltage starter

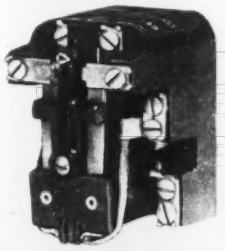
Heavy and standard-duty push-button stations

General purpose relay

A-c and d-c solenoids

Roller-lever-type limit switch

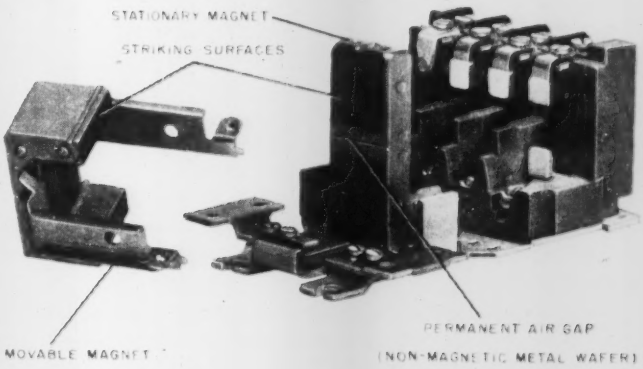

Rotating-type limit switch



NEW GENERAL-PURPOSE RELAY REDESIGNED FOR LONGER LIFE

The new CR2790E relay reduces your inventory — the basic relay and accessories meet a variety of applications. For general control-circuit applications, as a fractional-hp motor starter or, in combination with a magnetic switch, for controlling larger motors. Continuous current rating is 10 amps up to 300 volts on AC or DC. New long-life shunt assures top electrical performance. Bulletin GEC-257C lists available accessories, ratings and dimensions.

G-E MAGNETIC STARTER FEATURES PERMANENT AIR GAP



The G-E starter has a **permanent** air gap, a non-magnetic metal wafer mounted in a stationary magnet structure. Magnets never stick closed because of residual magnetism. The air gap is safely away from striking surfaces so the movable magnet cannot wear it down, no matter how often the starter is operated.

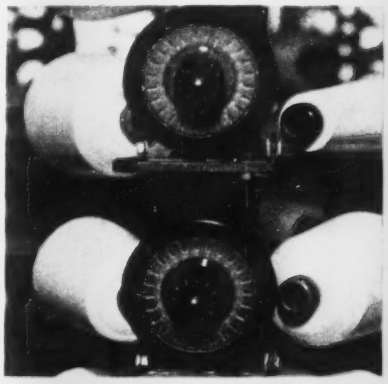
On some starters the air gap disappears as the magnets wear. With a G-E starter, however, you can be sure that every time you push the STOP button the magnet will drop out and stop the motor.

You're assured reduced maintenance, long mechanical life when you specify G-E magnetic starters.

NEW MAGNETIC BRAKE KEEPS TENSION CONSTANT

G.E.'s new tension brake — the first of its kind — is a magnetic device free of the basic disadvantages of friction devices, such as wide tension variations and undue wear. You'll find applications for the new brake wherever a constant tension is required — for yarns, rubber, glass fiber, and small diameter wire. Simple and compact, the brake holds tension constant at all speeds.

The size 200 brake has a torque range from 0.1 to 0.5 oz. in. and a tension range from 4 to 10 grams. Shown at the right in a textile application, the brakes are mounted on a magazine-type warping creel. The larger brakes, sizes 300 and 400, have a torque range of 1.4 to 14 oz. in. over a speed range of 0 to 1500 rpm. Write for Bulletin GEA-5867.



Size 400 tension brake in resistor wire-winding application. Increase or decrease tension by turning easy-to-read, calibrated adjusting cap.

NEW G-E STOCKING PLAN ASSURES PROMPT SHIPMENT

G.E.'s new Prompt Service program assures you faster, better service for your order. The program is based on perpetual stocking in your area, and prompt shipment of widely used general-purpose devices. You pay no premium for this service and you'll need no follow-up on these orders. You can reduce your control inventory. Check coupon for complete information.

General Electric Company
Section B730-46
Schenectady, N. Y.

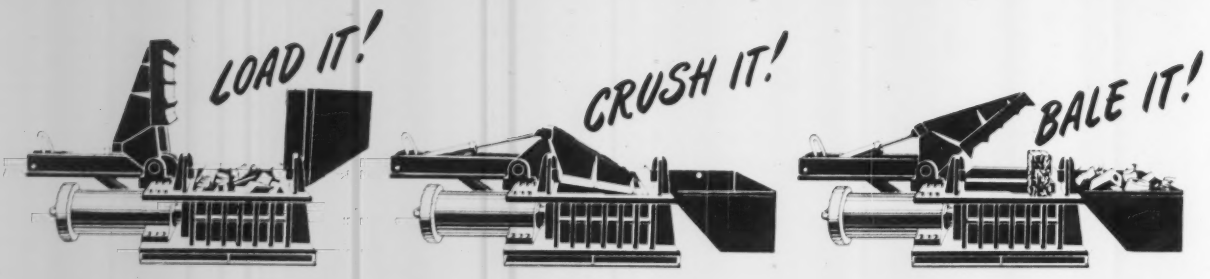
Please send me the Prompt Service Bulletin listing the general-purpose control devices stocked for immediate delivery in my area.

Name

Address

For more information contact your nearest G-E representative, agent, or distributor, or write Section B 730-46, General Electric Co., Schenectady 5, N. Y.

GENERAL ELECTRIC



We Build the Dempster-Balester to Load It, Crush It, Bale It— Bale After Bale After Bale

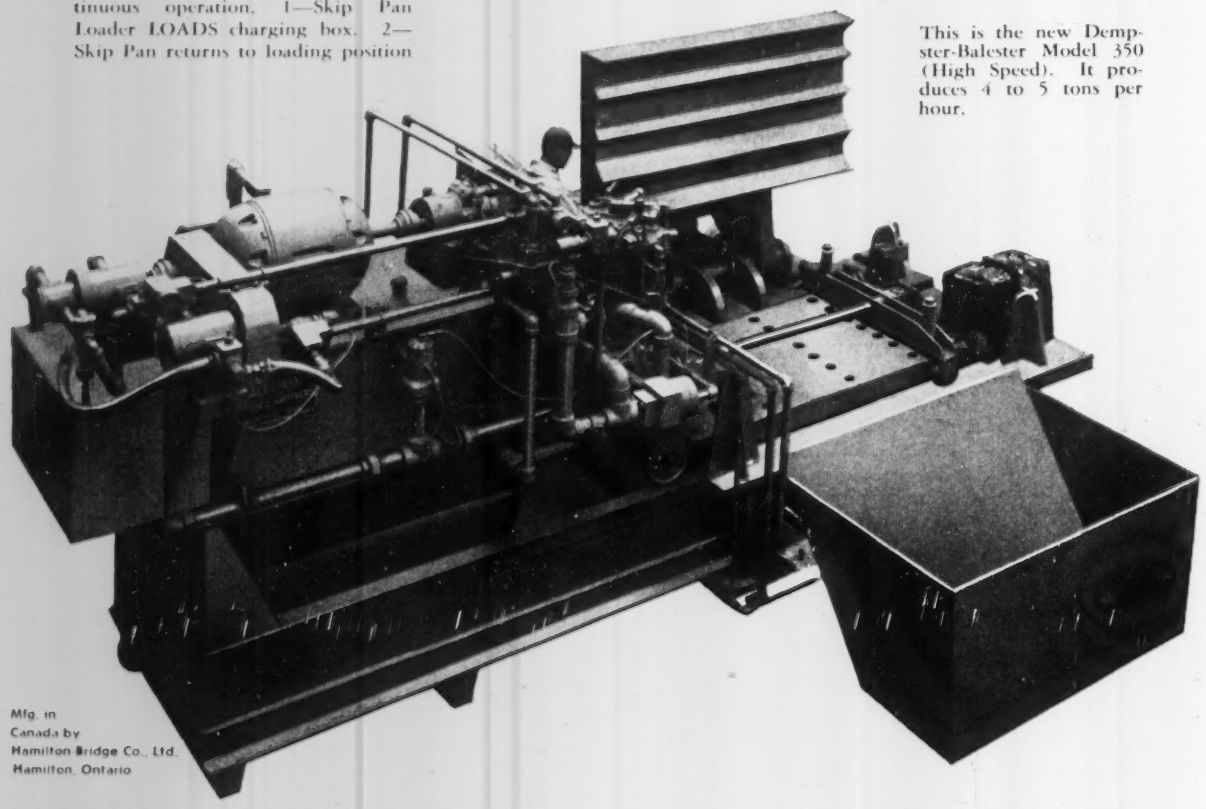
You not only get the nearest thing available to automatic baling when you buy a Dempster-Balester, but you get a press built to take the punishment of scrap metal baling consistently day-in and day-out . . . bale-after-bale-after-bale! The first Dempster-Balester was built in 1940 and it is still in operation. Today, hundreds of Dempster-Balesters are making money for men like yourself in over 200 cities in almost every state of the union, plus 15 foreign countries.

The Dempster-Balester's LOAD IT, CRUSH IT, BALE IT cycle (illustrated above) is a simple 1-2-3 continuous operation. 1—Skip Pan Loader LOADS charging box. 2—Skip Pan returns to loading position and Auxiliary Compression Door CRUSHES scrap with a 45-ton force. 3—As Compression Door returns to up-right position, charging box door closes . . . scrap is BALED and ejected. As each cycle ends another begins.

Without question, Dempster-Balesters are the fastest, most efficient presses baling scrap metal today! And you have six to choose from—three standard and three high speed models that turn out high density bales in capacities to meet any requirement from 1 to 9 tons per hour.

And don't overlook this important point. Before buying a baling press, it's important to know what kind of service you can expect. Certainly, no piece of heavy machinery can operate consistently without maintenance. Breakdowns cost money and when a part is needed for one of our presses, it is usually shipped the day your order is received. An ample stock of repair parts is constantly maintained to take care of you promptly! Write to us today for complete information.

A product of Dempster Brothers, Inc.

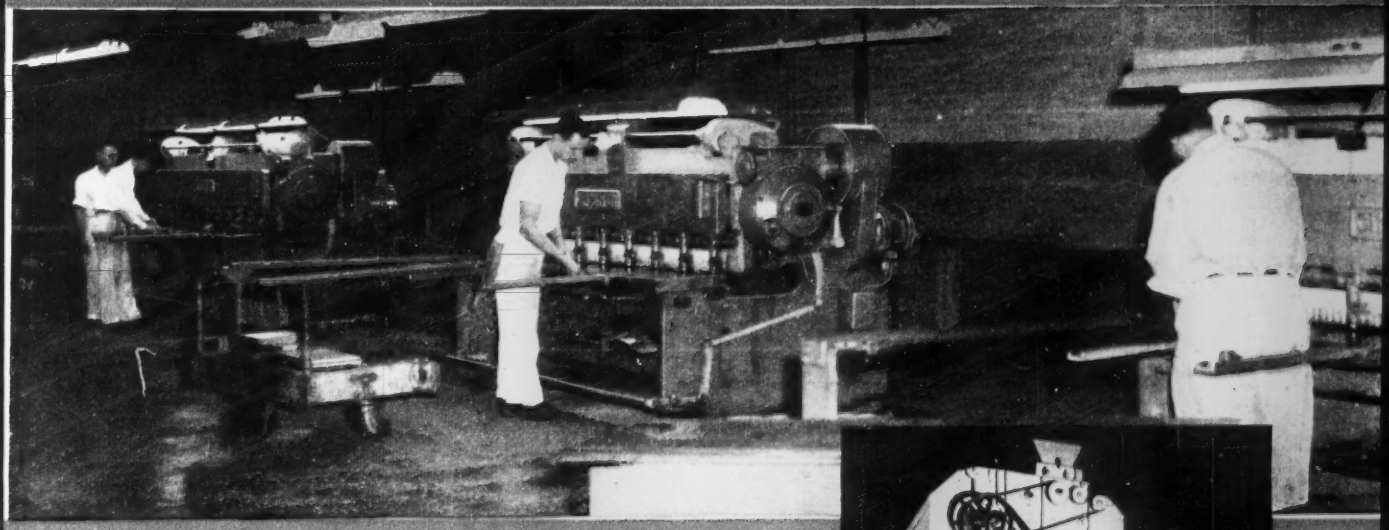


This is the new Dempster-Balester Model 350 (High Speed). It produces 4 to 5 tons per hour.

Mfg. in Canada by Hamilton Bridge Co., Ltd. Hamilton, Ontario

DEMPSTER BROTHERS, 893 Shea Building, Knoxville 17, Tennessee

3 CINCINNATIS ....shear 750,000 lbs. of steel every 22 days



THIS productive and dependable battery of Cincinnati Shears at the John E. Mitchell Company is shearing with accuracy in the manufacture of extracting, cleaning and drying equipment.

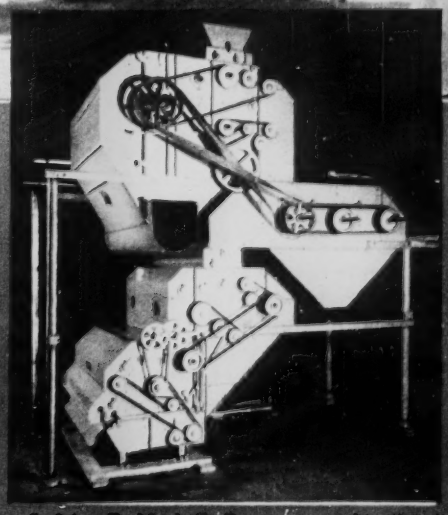
Freedom from shut downs, long knife wear, efficient, accurate ganging and general ease of control all contribute to this steady production.

C-1010 steel in 20, 16, 12 and 7 gauges is being handled.

A 6-foot, 8-foot and a 10-foot Cincinnati Shear make up the battery.

Cincinnati All-Steel Shears are economical producers, and their accuracy also reduces assembly costs.

Write for latest Shear Catalog—S-6—on the complete line of Cincinnati All-Steel Shears.



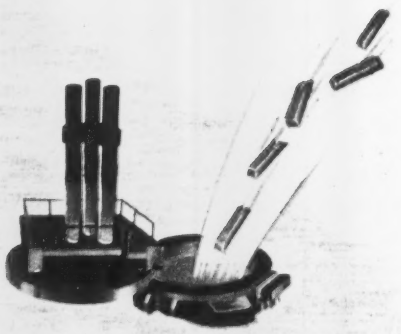
A John E. Mitchell Company combination machine used in cotton gins. Photos courtesy of the John E. Mitchell Company.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

Will the product you plan to make...



. . . . . need

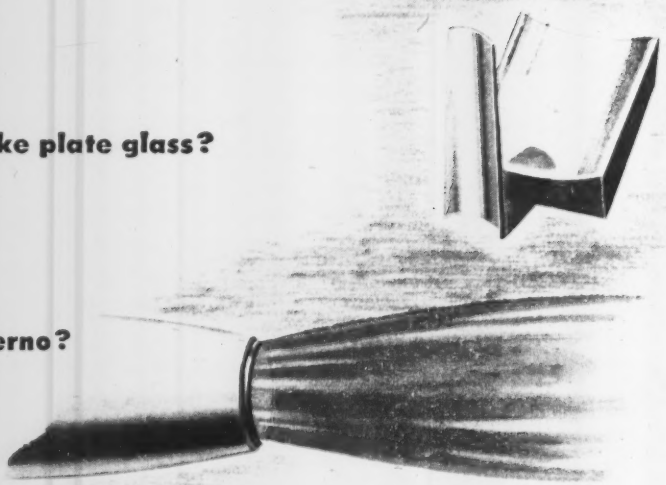
an alloy so tough you may not yet have heard of it?

. . . . . require

a forged finish like plate glass?

. . . . . face

a man-made inferno?



You may even have a twist or two of your own to add to the problem the Jet Division helped solve for jet aircraft engine builders . . .

The "buckets" (paddles) on the turbine rotor at the rear of a jet engine whirl around about 10,000 times a minute, pulsed by a white-hot blowtorch of flame. To withstand this roaring inferno, the bucket surfaces and curves must be forged even smoother than glass. They must be made of an alloy tougher than the toughest steel. They must "take" this red-hot ride for hours without stretching out, or "creeping", from centrifugal force and heat.

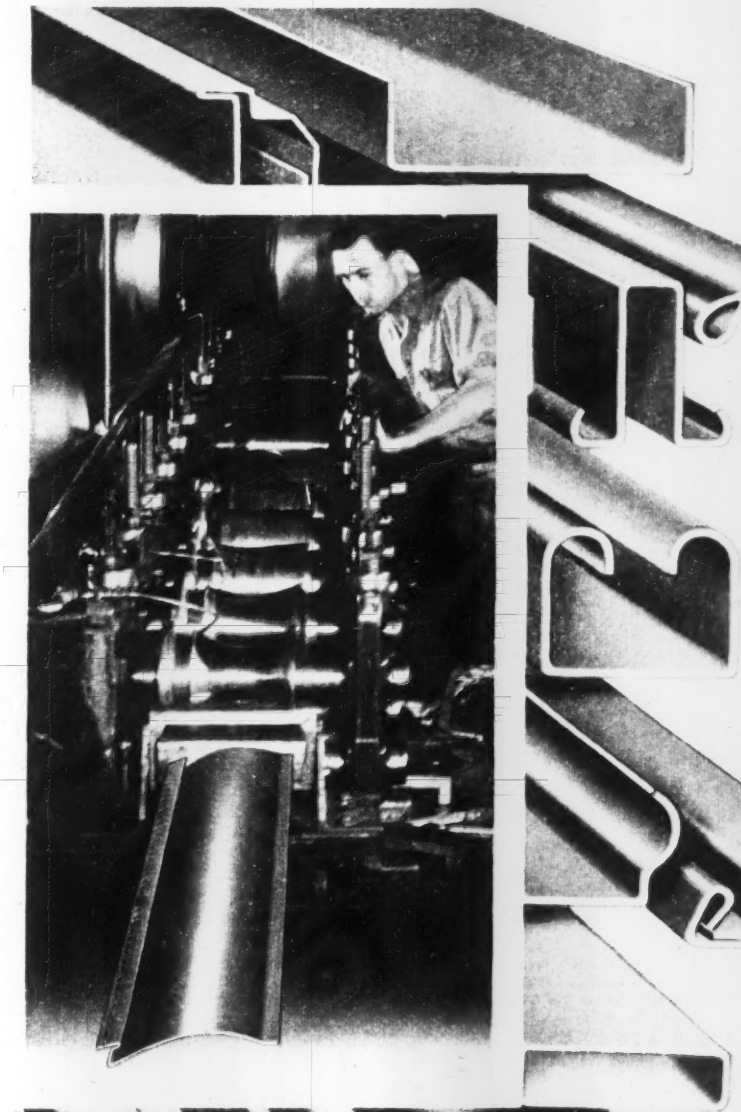
The Jet Division makes more buckets for America's engine builders than any other manufacturer. We forge super-strength alloys into finished parts so smooth and accurate that they need no costly, lengthy finish-machining or polishing.

If your product or product-to-come must meet one of these conditions . . . two . . . three, or, even a brand new one, it can pay you to get in touch with us now.

JET DIVISION

Thompson Products, Inc.

CLEVELAND 17, OHIO



COLD ROLL FORMING for Highest Strength–Weight Ratio

The trend in product design is strongly toward elimination of useless weight, not only in automotive and other transport equipment but also in home, office and business appliances, and other products.

Plain structural members are constantly being replaced by designed shapes made by cold-roll-forming, because of their higher strength-weight ratio and because they can be made to combine the functional with the decorative.

There are, in fact, few shapes which can not be made lighter or stronger, or both, by continuous cold-roll-forming from coiled strip than by any other method. The material-saving through weight reduction often exceeds the entire conversion cost.

In making products for which the demand is growing, the installation of a Yoder cold-roll-forming machine also answers the need for higher production at greatly reduced cost, especially when other operations can be tied in with it at little or no extra cost.

Literature, recommendations and estimates, without cost or obligation.

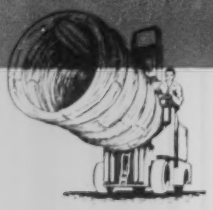
THE YODER COMPANY
5502 Walworth Ave. • Cleveland 2, Ohio

Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS–cold forming and welding

ENGINEERING YODER MANUFACTURING

INSIDE AN EXIDE-IRONCLAD



Inside . . . where it counts most . . . EXIDE-IRONCLAD is entirely different than any other battery. It's made that way by EXIDE'S exclusive IRONCLAD slotted-tube construction . . . a principle that provides direct operating-hour savings for you.

OF *ALL* BATTERIES, ONLY EXIDE-IRONCLADS HAVE POWER TUBE POSITIVES

The positive plate is different . . . unique . . . exclusive. It is the most effective retainer of active material yet demonstrated in heavy duty service. Slotted tubes contain the active material. So fine are the slots that, while permitting easy access of electrolyte, they retard the active material from washing out, hold it during repeated cycles of charge-discharge, and the vibration of rough use.

Today's battery-powered equipment is being used harder than ever before. Unless the batteries have internal shock protection they tend to deteriorate under hard usage—both electrical and mechanical. Only Exide-Ironclad has the plus-protection of the tubular positive that can withstand today's more exacting and rigorous heavy-duty battery services.

Your EXIDE sales engineer will give you the factual inside story. See for yourself why *only* an EXIDE-IRONCLAD gives maximum day-after-day service under the most difficult operating conditions . . . *with a minimum of maintenance expense.*

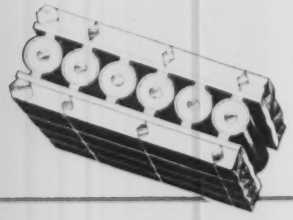
THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 2
Exide Batteries of Canada, Limited, Toronto

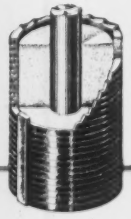
1888 . . . DEPENDABLE BATTERIES FOR 65 YEARS . . . 1953

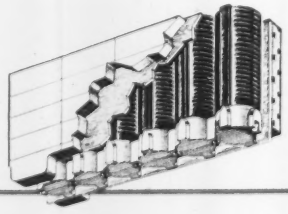
Cross section shows relation of positive plate to separators and negative plate. Note the much greater exposure of active material to electrolyte as compared with that of the usual flat positive plate. This greater exposure makes possible the high power ability and uniform-voltage characteristics of the Exide-Ironclad. The negative plates have been made extra heavy to balance the increased capacity of the power tube positives.

Running through center of each tube is an alloy core which is cast with the heavy top cross bar. These form the sturdy, non-buckling grid. Both core and top bar are made of Exide's new corrosion-resistant Silvium, an alloy of silver, lead and other components, which adds greatly to plate's long life.

New polyethylene insulating tube sealer of acid-proof, non-corroding plastic fits snugly into bottom of slotted tubes and further reduces loss of active material. Thus more active material remains available, and the high battery capacity is maintained for a longer working life.



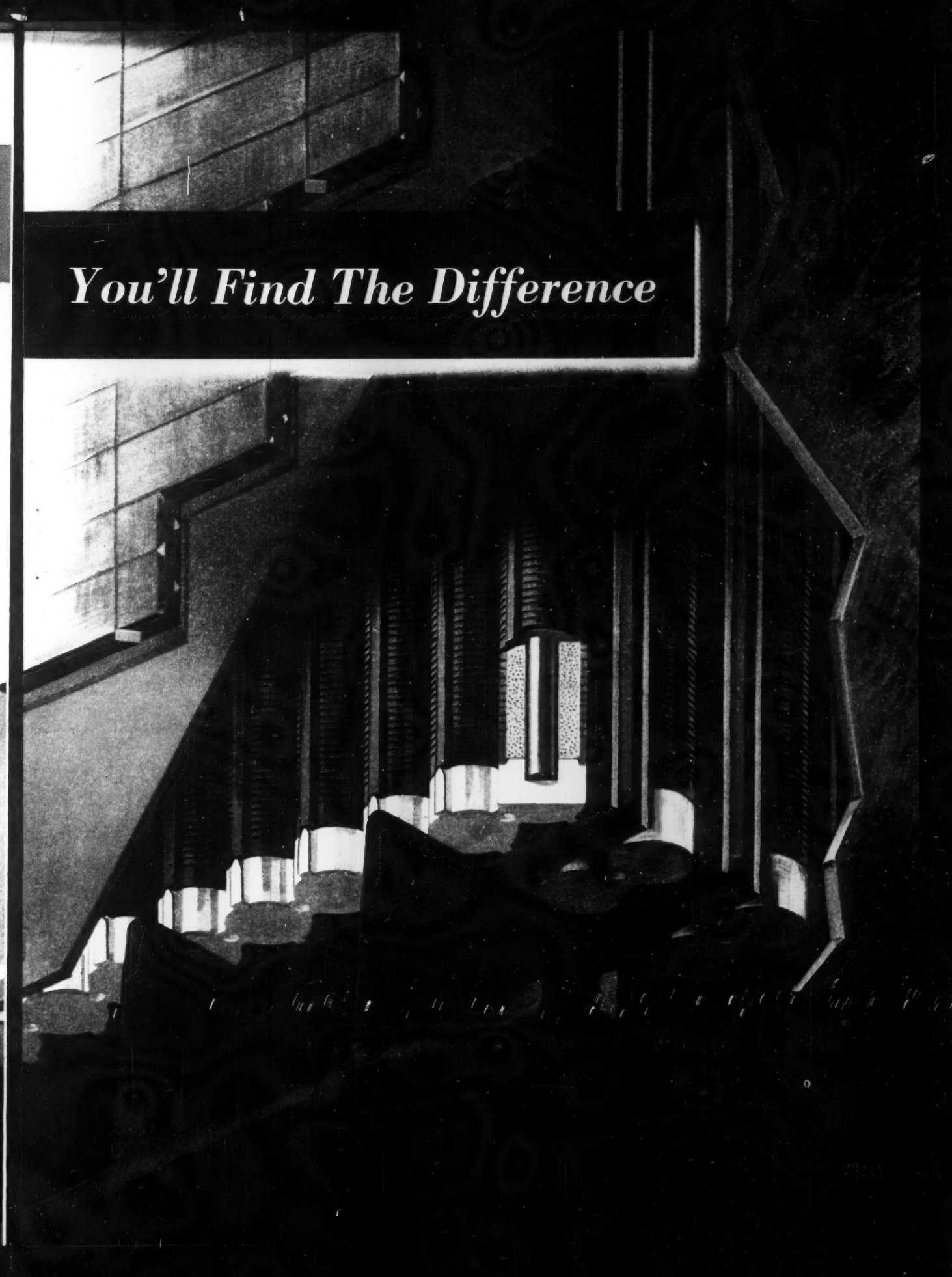


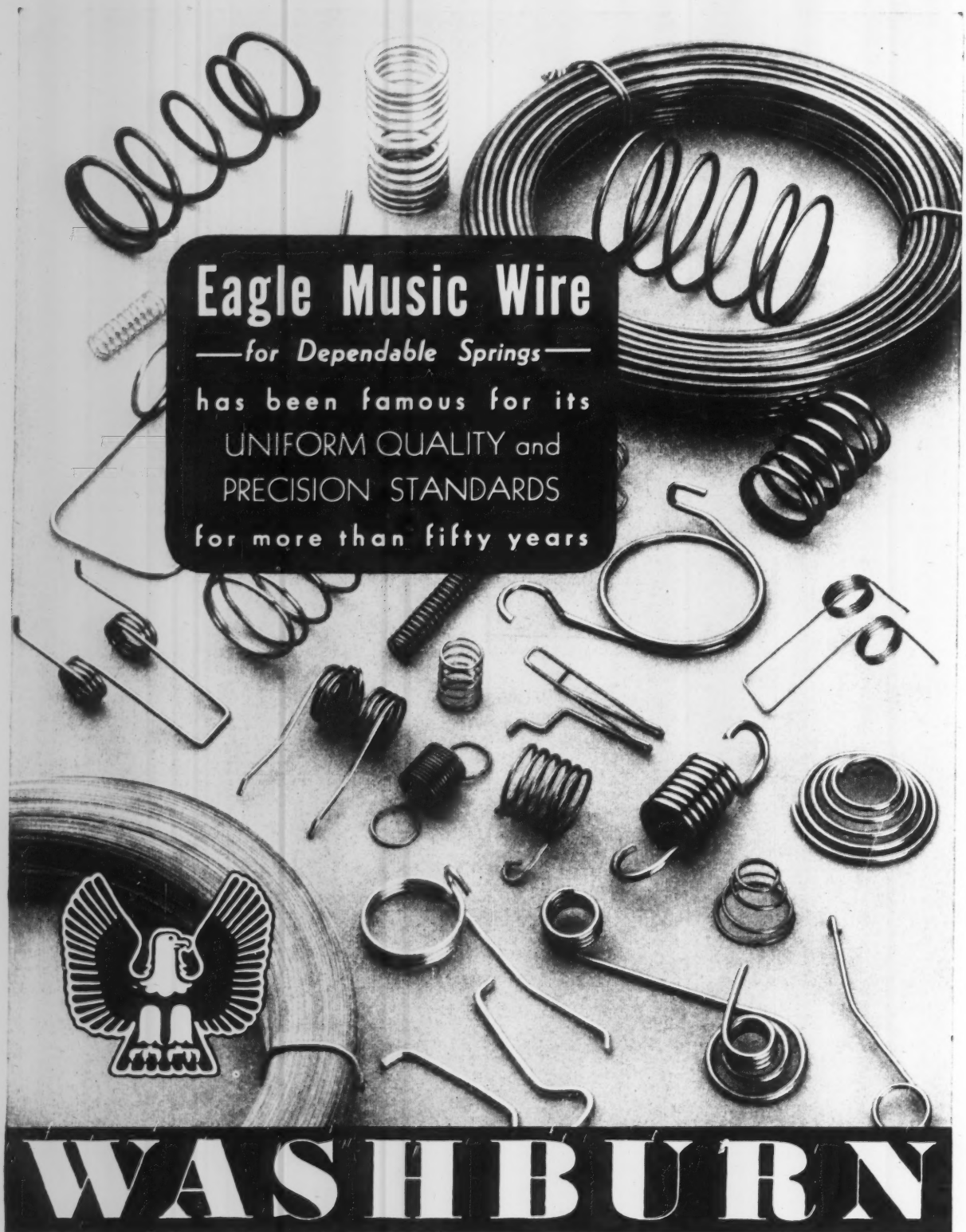


Exide-Ironclad

YOUR BEST POWER BUY . . . AT ANY PRICE

"Exide-Ironclad" and "Silvium" *Reg. T.M. U.S. Pat. Off.*


You'll Find The Difference

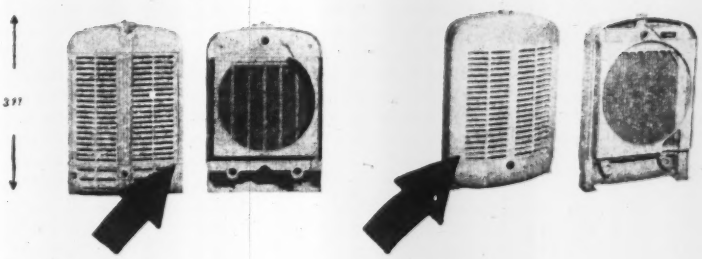


WASHBURN WIRE COMPANY, NEW YORK CITY

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS

TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

The trend is to more stampings WITH Bliss PRESSES

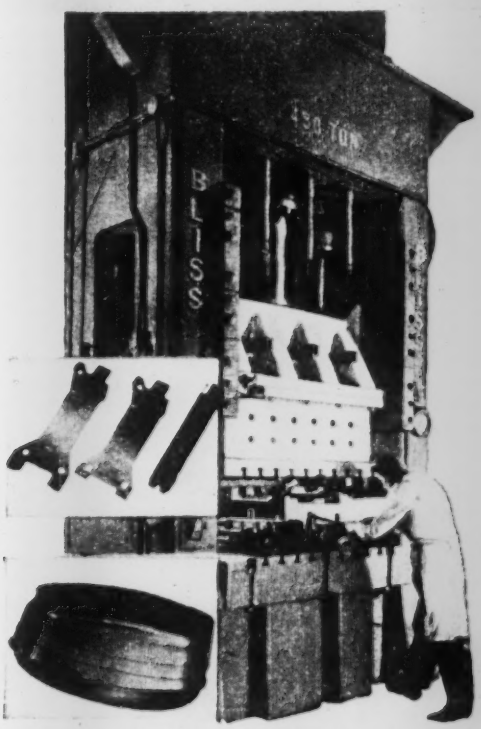


Casting-to-Stamping saves as much as 30% for Young Radiator Company

When Young Radiator Company, Racine, Wis., decided to redesign their line of automotive and industrial radiators, their thoughts turned to lighter, stronger, more clearly designed components. To gain these new design objectives, they converted from castings to stamped steel parts. And as they had done for 20 years, they asked Bliss to specify the right press for the job.

Bliss engineers studied the problem, recommended a 450-ton single-action Hydro-Dynamic press. Result: savings up to 30 percent, weight of the radiators halved; strength increased.

Says President F. M. Young, "We've long been advocates of Bliss presses and service." Proof of the statement is the fact that 70 percent of Young's pressroom is Bliss. Why not bring *your* metal-forming problem to Bliss? You'll find—as Young Radiator did—that Bliss has a press for almost every metal-forming operation.



Shown here are the second and third forming operations on radiator side members (inset, top). A third die handles initial piercing. A Bliss hydraulic cushion ejects the stamping... is also used as blankholder to draw the shell. Shells are center-split to form top and bottom of radiator housings (inset, bottom).

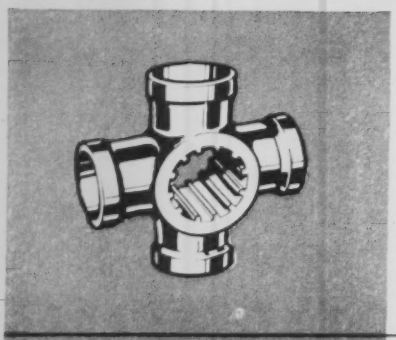
E. W. BLISS COMPANY, CANTON, OHIO
E. W. Bliss (England) Ltd., Derby, England
E. W. Bliss Company (Paris), St. Ouen sur Seine, France

PRESSES, ROLLING MILLS, SPECIAL MACHINERY

Branch offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo, and Toronto, Canada. **West Coast Representatives:** Moore Machinery Company, Los Angeles and San Francisco; Star Machinery Company, Seattle. **Other dealers** in United States cities and throughout the world.

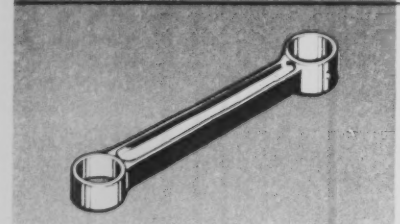
Bliss

on your press is more than a name... it's a guarantee!



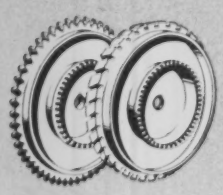
DETROIT BROACH TOOLS PROPELLER HUBS

Detroit Broach tooling for aircraft engine parts began with reciprocal engine designs. A typical example was the Detroit Broach tooling to produce the spline inside propeller hubs. In one pass, broaching produced a complete spline with consistent accuracy. This led to more accurate spline broaching in many other fields, too.



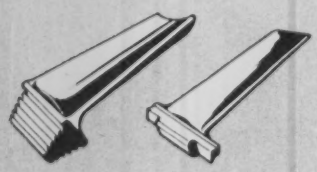
DETROIT BROACH TOOLS ARTICULATING RODS

As radial engines came to the forefront, new challenges in precision tooling were met by Detroit Broach ingenuity. Typical of reciprocal engine parts broached were articulating rods. Detroit Broach tooling produced a better finish and greater accuracy on the machined surfaces of these parts.



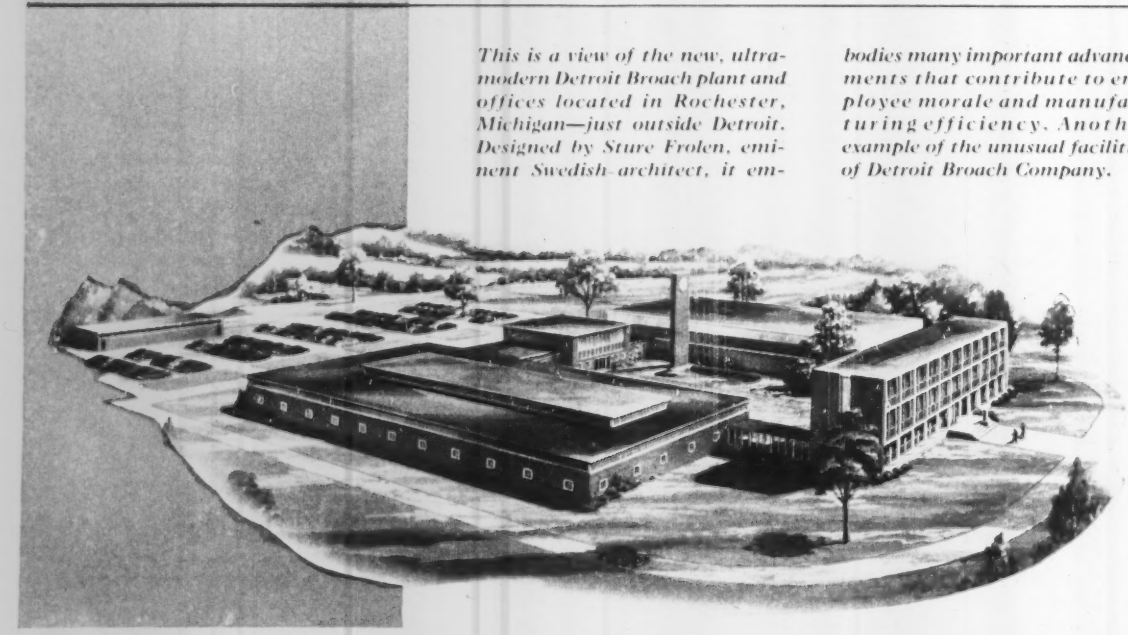
DETROIT BROACH TOOLS TURBINE AND COMPRESSOR WHEELS

With the advent of jet engines, the need for close-tolerance repetitive accuracy was even more acute. In addition came the problem of working with high-alloy, heat-resistant, tough-machining metals. Compressor and turbine wheels are typical of the parts for which Detroit Broach tooling is meeting all requirements with flying colors. Varied forms of slots are produced in these wheels, square, at helix and at conical angles to the axis.

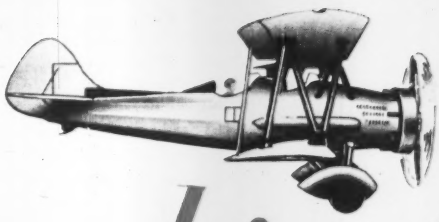


DETROIT BROACH TOOLS TURBINE AND COMPRESSOR BLADES

Mating parts to compressor and turbine wheels, the compressor and turbine blades are two more parts on which Detroit Broach tooling turned the trick. Intricate "Christmas Tree" forms, dovetail and "Ball Root" forms are easily produced with accuracy. At the same time, production costs are rock-bottom and surface finishes generally need no further machining.



This is a view of the new, ultra-modern Detroit Broach plant and offices located in Rochester, Michigan—just outside Detroit. Designed by Sture Frolen, eminent Swedish architect, it embodies many important advancements that contribute to employee morale and manufacturing efficiency. Another example of the unusual facilities of Detroit Broach Company.



Broaching Pioneers

IN THE AIRCRAFT INDUSTRY

Since the price of poor fits on engine parts may be paid in human lives, the aircraft industry was quick to recognize and adopt the inherent accuracies of broaching.

It was quick, too, to recognize the ability of Detroit Broach to engineer and produce tooling that met the need for concise repetitive accuracy . . . tooling with important production economies as shown on the opposite page.

in YOUR industry, too you will find many examples of Detroit Broach tooling that is producing repetitive accuracy, part after part after part. Just as important, it is tooling that consistently makes good common sense in terms of efficient operation and rock-bottom cost-per-piece broached.

These benefits that accrue Detroit Broach customers are not achieved by magic or by gift. They are the result of years of specialization in one important field . . . broaching. Every person, every machine, even plant facilities at Detroit Broach are geared to that single purpose.

In broaching it will pay you, too, to have a talk with Detroit Broach Company . . . pioneers in broaching yesterday, today, and tomorrow.

Detroit Broach COMPANY

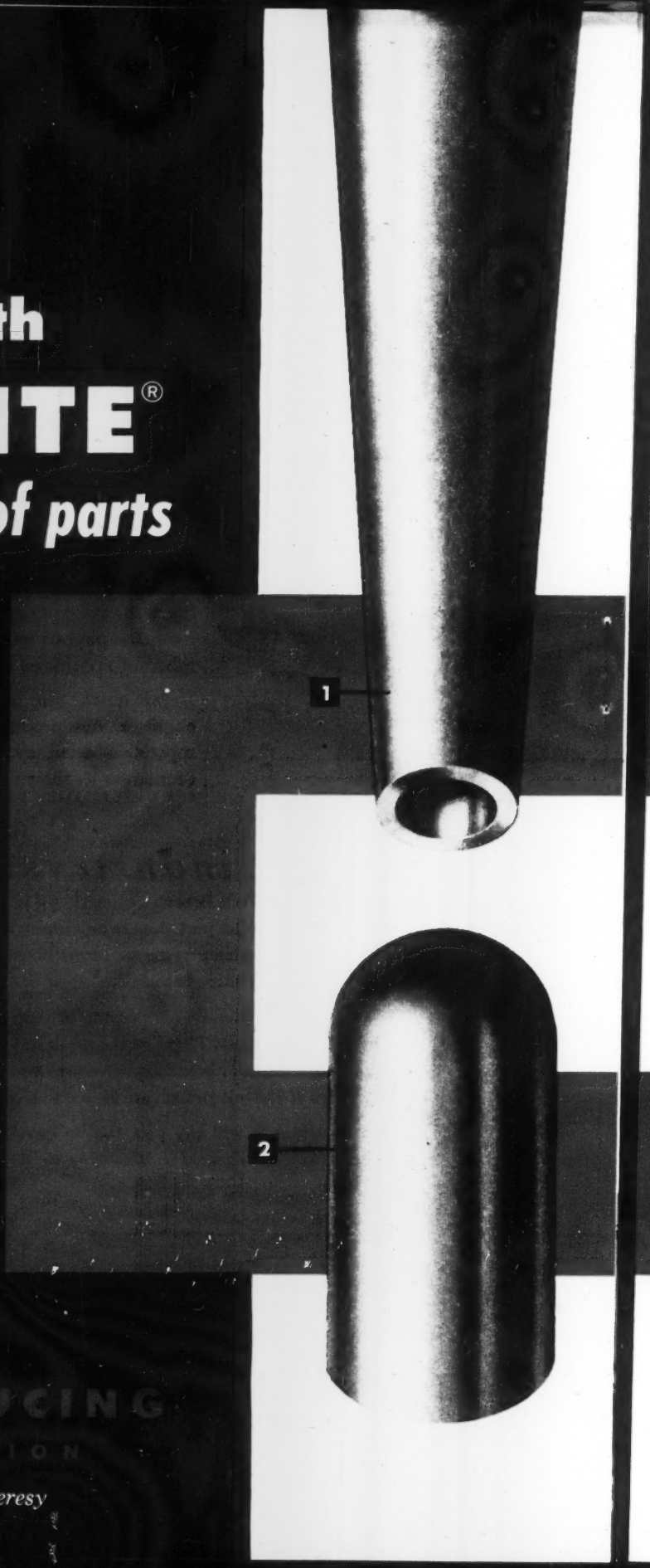
ROCHESTER, MICHIGAN

OFFICES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

Start right with ROCKRITE®

and cut the cost of parts

The superiority of Rockrite Tubing is due to the method employed to produce it—a distinctive method radically different from the conventional ones used to cold finish tubing. The superiority of the tubes thus produced results in better surface finish, superior machinability and improved mechanical properties. All of which means lower costs to machine or form ring shaped and tubular parts. In some cases costs can be cut in half. So it pays to start right with Rockrite, to make parts that are right—from start to finish. For more information write for Bulletin R2.



TUBE REDUCING CORPORATION

Wallington, New Jeresy

1. Tapered Tubes. Maximum OD at large end—5½"*. Available with straight taper or stepped, with wall thickness uniform or tapered.

2. Closed End Tubes. Maximum OD 5½"**. Closed by electric-resistance heating and spinning against a suitably formed die. Preserves close tolerances. Produces good finish.

3. Rockdrawn Tubing. OD ¼" to 1½". Lengths up to 65 ft. Quantities as low as 1250 ft. Rockrite close-tolerance tubing, cold drawn to small sizes, in small lots. Ideal for hydraulic lines. Has all three essentials for cold forming.

4. Inside Upset Tubing. Maximum OD 5½"*. Maximum length 65 ft. Maximum taper leading to offset portion, 7 degrees.

5. Flared Nozzle-End Tubes. Maximum OD 5½"**. Surface finish and tolerances much closer than attained by usual hot-forming methods.

6. Cylinder Tubing. OD 2" to 5½"*. Superior inside surface, no scoring, with low RMS rating. Ready to be cut to length and used as is with soft-packing pistons. Permits standardization of hydraulic and pneumatic cylinder parts.

7. Heavy-Wall Tubing. Sizes ⅛" to 5½" OD*. Wall thickness tolerances less than half those of commercial tubing.

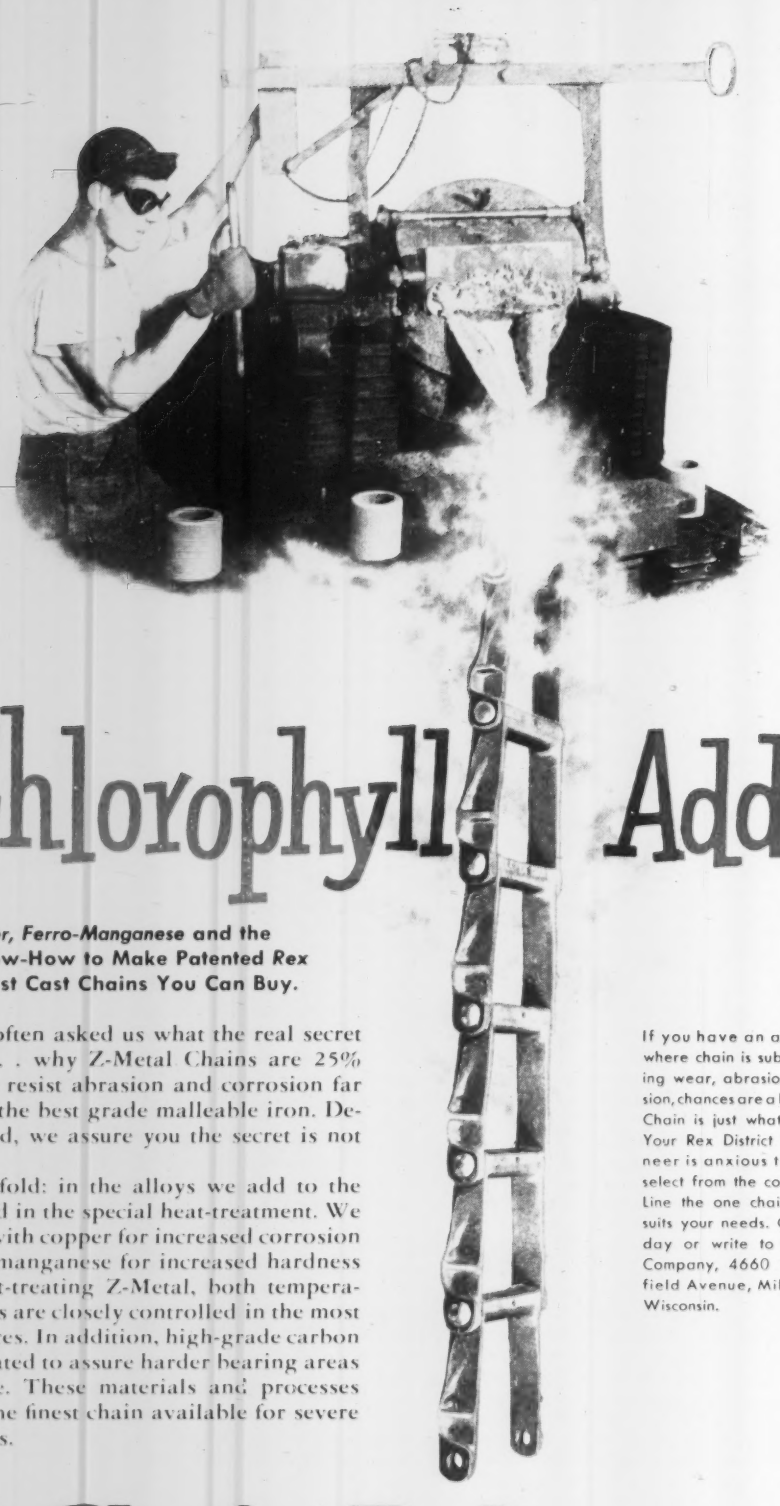
8 & 9. Special Bore Tubing. Maximum OD 5½"*. Bore shapes available—square, triangle, hexagonal, gear or spline, and numerous others with very slight radius at corners.

* Maximum OD will be increased to 17" in 1954.

**Maximum OD will be increased to 10" in 1954.

ROCKRITE®
TUBING

TA 183



No Chlorophyll Added!

But We Do Add *Copper, Ferro-Manganese* and the Latest in Foundry Know-How to Make Patented *Rex Z-Metal*—and the Finest Cast Chains You Can Buy.

Our customers have often asked us what the real secret of Rex Z-Metal is . . . why Z-Metal Chains are 25% stronger, last longer, resist abrasion and corrosion far better than chains of the best grade malleable iron. Despite the present trend, we assure you the secret is not chlorophyll.

The answer is twofold: in the alloys we add to the malleable iron . . . and in the special heat-treatment. We alloy malleable iron with copper for increased corrosion resistance, and ferro-manganese for increased hardness and strength. In heat-treating Z-Metal, both temperatures and atmospheres are closely controlled in the most modern electric furnaces. In addition, high-grade carbon steel pins are heat-treated to assure harder bearing areas and longer chain life. These materials and processes produce, we believe, the finest chain available for severe cast chain applications.

If you have an application where chain is subject to sliding wear, abrasion, or corrosion, chances are a Rex Z-Metal Chain is just what you need. Your Rex District Sales Engineer is anxious to help you select from the complete Rex Line the one chain that best suits your needs. Call him today or write to Chain Belt Company, 4660 W. Greenfield Avenue, Milwaukee 1, Wisconsin.

CHAIN BELT REX COMPANY

Chain Belt COMPANY OF MILWAUKEE

Atlanta • Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Dallas Denver • Detroit • El Paso • Houston • Indianapolis • Jacksonville • Kansas City • Los Angeles • Louisville • Midland, Texas • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • Portland, Ore. • West Springfield, Mass. • St. Louis • Salt Lake City • San Francisco • Seattle • Tulsa • Worcester

Distributors in principal cities in the United States and abroad

EXPORT OFFICES: 4800 W. Mitchell Street, Milwaukee, Wisconsin; and 19 Rector Street, New York City.

Unsurpassed-anywhere!

IT ALL COMES DOWN to one fact . . . that you can always count on Roebling high carbon flat spring steel to reduce preparation time, machine stoppages and rejects to a minimum. What's more, it's made as you want it . . . annealed, hard rolled untempered, scaleless tempered, tempered and polished, blued or strawed.

You *pay* for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

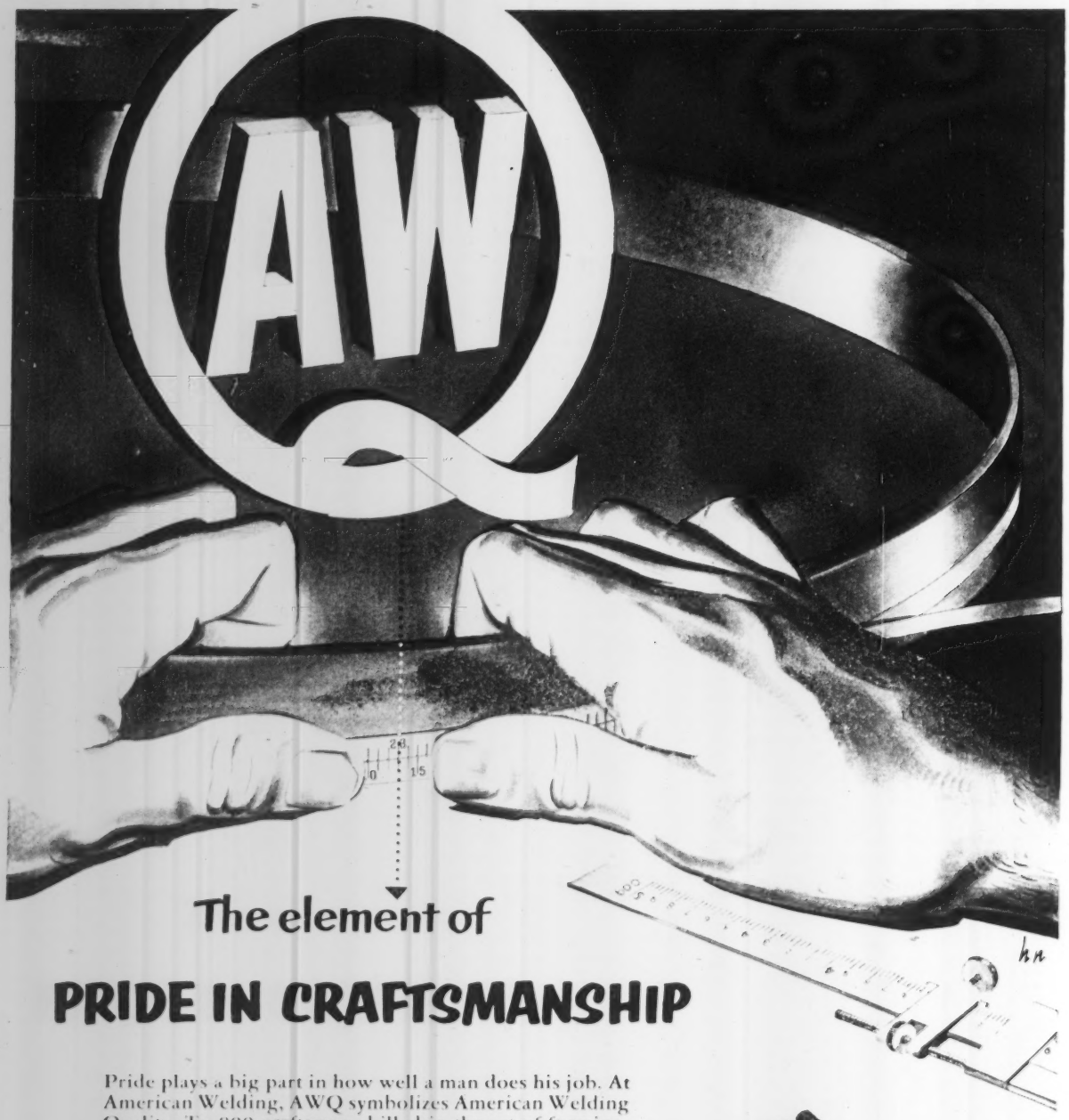
ROEBLING

A subsidiary of The Colorado Fuel and Iron Corporation

California giant Sequoias — largest of all trees.

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13224 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 815 FISHER BLDG. • HOUSTON, 6215 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

PHOTO BY MC MANUS



The element of

PRIDE IN CRAFTSMANSHIP

Pride plays a big part in how well a man does his job. At American Welding, AWQ symbolizes American Welding Quality. To 800 craftsmen skilled in the art of forming, welding and machining of rings, bands and assembled components it is a constant reminder that know-how and good equipment are not enough. Every man must constantly strive to do his best.

It is this pride in one's job that enables American Welding to produce welded components with the same care that you would use in your own plant. So, if your problem can be solved by welding — either fusion or resistance — of any type of material — or a component or part that can be joined by welding — call your local Amweld representative or write us. We will be happy to put plant facilities, 35 years of experience, and most important, men with pride in AWQ, to work for you.

A company you'll like to deal with

THE AMERICAN WELDING & MANUFACTURING COMPANY • WARREN • OHIO

STEEL
September 28, 1953

Metalworking Outlook

Steady Prices?

Watch for the cost-of-living index to level off or even drop slightly over the rest of the year (p. 63). The boost of 0.3 per cent between July and August to 115.0 per cent of the 1947-1949 average may well be the last increase in 1953. Declining inventories, freer supplies of metals and components and a return to competition all contribute to stable or slightly declining prices. Significantly, the July-August rise was primarily in nonmanufactured items that go into the Bureau of Labor Statistics' index—food, housing, medical care, recreation and transportation. The transport factor in the index will probably continue to climb this year because some 1.3 million railroad workers got a 3-cent-an-hour escalator pay boost because of the July-August jump.

Good Year for Steel

September promises to be the lowest steel production month in 1953, at only 8.8 million tons, but steel companies are not worried about this year's financial prospects. Republic Steel Corp., for example, is well on the way to establishing in 1953 the highest sales in its history, with volume approximating $1150 million, up 25 per cent from 1952. Armco Steel Corp. sales for the first nine months are expected to be 17 per cent ahead of those for the same 1952 period.

They Nearly Balance

Expect a pleasant personal tax reduction next Jan. 1? Personal income taxes will drop 10 per cent, but social security charges will go up, too. Research Institute of America points out that a married man with two children earning $75 a week will have 40 cents less withheld, but will pay 38 cents more for social security. If he earned $100 a week, he'll have $1 less withheld, but will pay 50 cents more for social security.

Lincoln Gets Hydra-Matics

Lincoln will resume production in November of 1954 cars equipped with Hydra-Matics of the same type used on 1953 and previous models. The transmissions for the Lincoln are expected to be obtained from the Riopelle plant in Detroit where production was suspended a few days before the Livonia fire. Machines for producing the unit have since been moved back into the plant. Parts used in many cases will be supplied by subcontractors. The Riopelle operation is expected to be only a temporary expedient for limited production until Willow Run is ready.

Just Scratching the Surface

"We have only scratched the surface in locating mineable materials." So says Assistant Secretary of the Interior Felix Wormser. He believes that

Technical Outlook—p. 85 The Market Outlook—p. 127

work being done by such groups as Interior's Geological Survey in developing better methods to detect mineral wealth and Interior's Bureau of Mines in developing better methods to use low-grade ores will keep America in good supplies. "I do not agree with many Paley report conclusions," he says.

Rough Sailing Ahead

The Commission on Foreign Economic Policy, chairmanned by Clarence Randall, is headed for some rough sailing that will tax even the leadership of the Inland Steel Co. executive. The group must come up by next March with recommendations that can lay the groundwork for this nation's foreign trade policies. Mr. Randall must reconcile some widely divergent opinions among his members. Of the ten congressmen who are members, four are for protective tariffs, four for free trade and two are middle-of-the-roaders. The seven appointees by President Eisenhower range in viewpoint from Mr. Randall to David McDonald, president of the United Steelworkers.

FTC Takes a Look

The Federal Trade Commission may get tougher about compliance with its rulings. It has just launched a study of compliance with the 180 sets of trade practice rules, 8400 stipulations and 4500 cease-and-desist orders which it has outstanding. Right now it doesn't know what the degree of compliance is. When the study is completed, odds are that FTC will tighten up.

By 1956: Plenty of Color TV

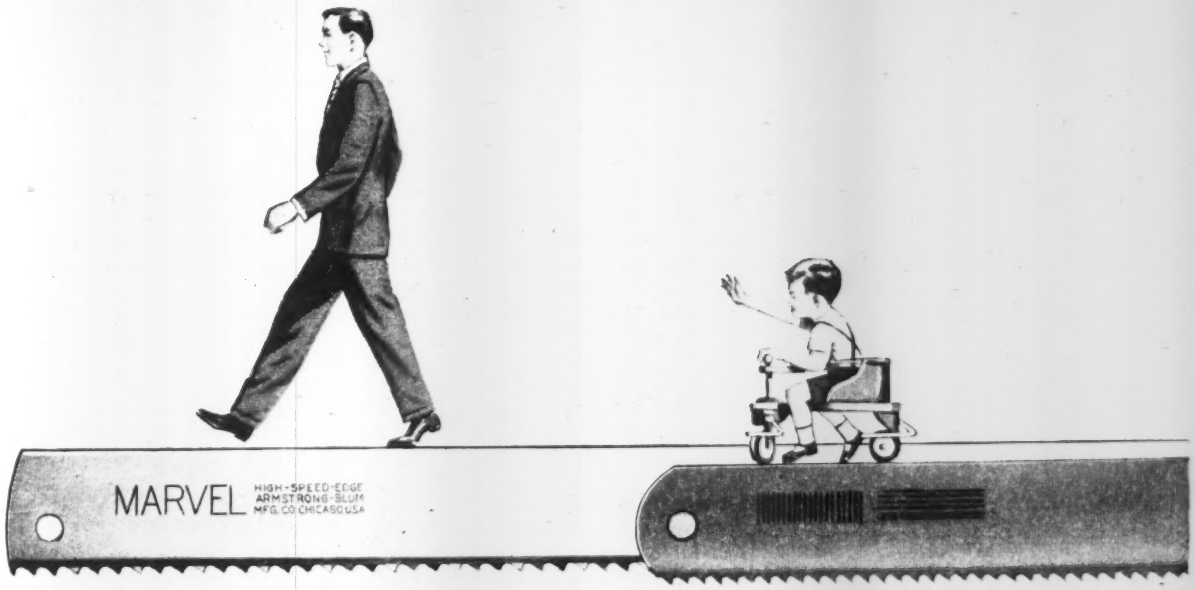
Look for color television sets to be in free supply by early 1956. First receivers will cost about $800 for screens above 12 inches in size. That dimension was the common starting point for black and white sets.

Straws in the Wind

Expect no substantial relaxation in nickel controls before Jan. 1 . . . The completely automatic factory is entirely feasible from an engineering standpoint but probably not now economically practical, says R. C. Sollenberger of Conveyor Equipment Manufacturers Association . . . Watch for more atomic ammunition production now that the Army is sending the first 280mm artillery battalion to Europe . . . Some 8 million clerical workers today draw a total pay of $35 billion a year.

This Week in Metalworking

You can expect even more extensive uses of metal powder (p. 45) . . . Ten factors make Under Secretary of Commerce Walter Williams predict continued prosperity (p. 46) . . . The Treasury is considering asking Congress for a 6 per cent sales tax, not 5 per cent (p. 47) . . . Uses for tin cans will increase markedly in 1954 as canmakers spend $8 million yearly on research (p. 48) . . . Capital equipment prices have not increased as rapidly as wage and materials costs (p. 51) . . . A promising new market for motor control manufacturers is with smaller firms (p. 56).



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Balance of Power

So much fuss has been raised over the charges and countercharges issued in connection with the resignation of Martin Durkin from the Eisenhower cabinet that it becomes desirable for thoughtful Americans to review in their own minds just what kind of a job their secretary of labor should be performing. Certainly clarification is called for because for a long time there have been conflicting ideas as to what interests should claim the secretary's primary attention.

Presumably the original objective of the Department of Labor and therefore the duty of the secretary of labor was to foster, promote and develop the welfare of the wage earners of the United States, to improve their working conditions and to advance their opportunities for profitable employment. In adapting this objective to currently existing conditions we must take into account that less than a third of the nation's wage earners are members of unions and that more than two-thirds are not members.

This leads to the obvious question as to what degree of attention the secretary of labor should pay to union leaders in order to discharge his duty of promoting the welfare of all wage earners. On this question, the ardent new dealers of F.D.R. days believed the secretary of labor and in fact the entire government should pay great attention to union chieftains—even to "clearing" everything "with Sidney." Fair dealers, in H.S.T. days, went further. They thought the executive branch of the federal government should serve as the business agent of unions.

Congress never has accepted these extreme views. It voted overwhelmingly for the Wagner Act to make it easier for employees to bargain collectively. When this act seemed to give unions too much power, Congress voted even more overwhelmingly for the Taft-Hartley Act to restore a reasonable balance of power.

A good secretary of labor under circumstances existing today would be one who recognizes the desirability of maintaining a fair balance of power between unions and nonunion employees on one side and employers on the other side. In time, such an attitude would win widespread public approval and respect.

E. L. Shaner

EDITOR-IN-CHIEF

THE BUSY MONONGAHELA: To a steadily increasing extent television is providing the American public with a more intimate and certainly a more accurate conception of how industrial operations fit into the nation's economy. An excellent example was the "March of Time" program last Wednesday evening. It dealt with the heavy movement of raw materials

for steelmaking by barge on the Monongahela river.

Most of the action centered about a diesel-powered Jones & Laughlin river vessel with a tow of six coal barges which was making a trip from up-river mines near Morgantown, W. Va., to Pittsburgh. The narrator repeatedly stressed the fact that the change from steam to diesel power was an important development in the history of navigation on the Monongahela.

This, of course, is true, but to thousands of old-timers who served in this wonderful valley the major change has been the shift in the transport of coal and coke from a dominant movement by rail to a dominant movement by conveyor belt and barge.

* * *

FRANTIC RAILROADING: Forty years ago the Monongahela valley furnished one of the richest sources of profitable railroad freight traffic in the world. In the lower Monongahela the Pennsylvania, Pittsburgh & Lake Erie and Baltimore & Ohio railroads thrived on the heavy shipments of coal, coke and finished steel products. The Monongahela division of the Pennsylvania Pittsburgh to Brownsville to Uniontown, Pa. was reputed to have the heaviest volume of freight of any railroad unit in the country.

Every evening from the roundhouses of these three roads came locomotives, each of which hooked onto 80 to 100 empty coal or coke cars. Each locomotive climbed from the Monongahela shores to the mines and beehive ovens above. At each mine or oven, empties were left on side tracks. At the end of the run, as for instance Marietta, all of the empties had been disposed of. On the return trip down valley, the locomotive picked up the 80 to 100 which had been loaded during the day.

Today much of the material travels by conveyor belt through tunnels to barges in the river.

* * *

DO NOT UNDERRATE TV: Use of television in industry is in its infancy. A few companies have found ways to employ this relatively new medium to advantage, but it can be said with certainty that in general the opportunities for the use of TV in manufacturing operations have been largely ignored to date.

An interesting exception is the setup in a Cadillac Motor Car Co. plant in Detroit (p. 57) where the operator of a scrap baler can keep track of the loading of bales of scrap into railroad cars by means of the actual picture on a TV screen. Banks, retail stores and other institutions are beginning to employ TV to show customers their accounts as revealed on a screen from a bookkeeping department housed several blocks away. Metalworking plants will discover many opportunities to use this technique effectively.

* * *

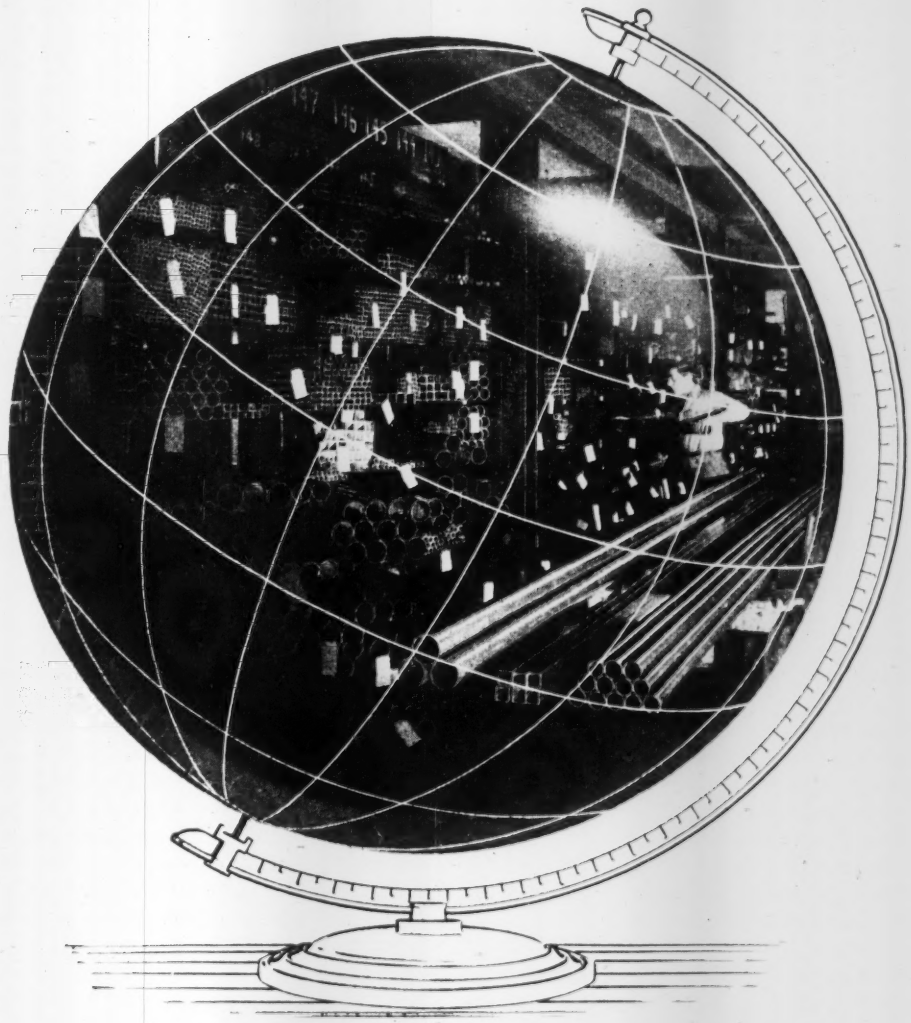
ACCENT ON ALUMINUM: While on the subject of television, we wonder how many viewers noticed that Edward R. Murrow's Sunday night excellent portrayal of contrasting conditions in the eastern and western zones of Berlin gave his sponsor, the Aluminum Co. of America, a wonderful opportunity to display and describe the really remarkable features of the company's new skyscraper office building in Pittsburgh.

While this unusual structure was commanding attention, a modest ceremony of great importance took place yesterday in a small Ohio village. At Thompson (population 150) in Geauga county, a granite and aluminum memorial to Charles Martin Hall was unveiled at a spot on the village green opposite the house where he was born on Dec. 6, 1863. In 1886 Hall perfected the process of extracting aluminum from its ores in a woodshed behind his home in Oberlin, O. How tremendous are the outcomes from small beginnings!

* * *

NOW POWDERED METAL: Powdered metal parts are playing an increasingly important role (pp. 45, 59) in the design and construction of many products of the metalworking industry. Somebody has estimated that 50 to 60 per cent of powdered metal parts production goes to the automobile manufacturers. Your car may have as many as 75 powdered metal parts. The auto industry is using twice as many powdered metal parts today as it did at the end of World War II in 1945.

The simple reason for this gain is economy. Powdered metal parts often yield a 20 to 70 per cent saving in machining costs. Some of them have definite advantages in their capacity for prelubrication. In some applications their resistance to wear is superior to some other materials. They merit careful consideration by all metalworkers.



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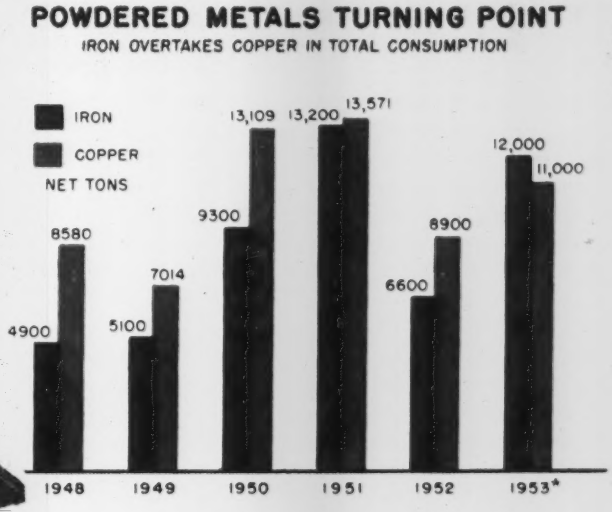


* Estimated by STEEL

All iron powder consumption figures are interpolations. They include both domestic and foreign shipments. Total use of iron powder cannot be obtained by adding domestic and foreign shipments because there is some use of foreign powder in domestic mixes.

Powdered Metal Opens a Door

Starting as simply the process to make self-oiling bearings, powder metallurgy has gained stature in structural applications. That opens the door to more sales in metalworking

POWDER METALLURGY, which has been knocking on industry's door for years, proved it was strong enough to open that door.

Iron powder, strong man of the metal powder team and basis for most structural PM parts, overtook copper in total consumption this year (see the chart). That means emphasis has shifted to producing structural parts, where strength counts, by this process. The shift is actually stronger than indicated by the over-all figures in the chart since some copper is used as an alloying or infiltrating agent in many basically iron powder parts.

Infiltrated—For example, General Electric Co. points out the gearing mechanism which actuates the agitator in its automatic washing machine consists of a set of four gears up to 4 inches in diameter made of high-carbon, copper-impregnated iron powder having a tensile strength of 85,000 psi.

And More Coming — National Cash Register Co. has more than 90 different metal powder parts in production, many of which must resist considerable impact in use. The company is making PM parts at a rate of over 36 million a year.

Lionel Corp. replaced a zinc die casting and steel tire for locomotive drive wheels with a single metal powder compact. Cost of the finished PM wheel is less than 60 per cent of the zinc alloy alone, and the PM wheel has an advantage of a 25 per cent higher coefficient of friction against the rail.

The Bandwagon—More and more metalworking firms are leaping on the powdered metal bandwagon in one way or another. Earl Richards, vice president in charge of planning and development, Republic Steel Corp., says Republic's powder metal plant at Toledo, O., will be in full swing probably by next summer. The plant will have a capacity of 25 tons a day. Yale & Towne Mfg. Co., which bought out American Sintered Alloys Inc., Bethel, Conn., a year ago, recently purchased the Powder Metal Products Corp. of America, Franklin Park, Ill. Other fork truck makers started using sintered bronze bushings for truck applications and now are setting up dies for double-acting tilt cylinders for truck masts also.

Thompson Products Inc.'s Metallurgical Products Division was content, until recently, to produce powdered metal parts for its unique application in jet engine compressor blades. Now that division is entering the commercial PM market with structural parts tailored to the customer's needs.

Raising the Bid — Two things have backed PM's strong bid for new structural markets: 1. Growing availability of pure iron powder. 2. New production techniques.

Domestic iron powder shipments (included in the totals in the chart) jumped from 3100 net tons in 1952 to an estimated 6500 net tons in 1953. They're about equal to foreign imports. Besides the boost in production expected from the Republic Steel plant next year, domestic iron powder output will be increased sharply in the next few weeks when the Riverton, N. J., plant of Ekstrand & Tholand Inc. comes into operation. That company is sales representative for the Swedish firm, Hoeganaes Co. The

Riverton plant has primary reduction capacity of 15,000 tons a year and secondary finishing capacity of 29,000 to 30,000 tons. There's presently 30,000 tons of ore on the ground at Riverton.

Strong But Cheap—Main efforts in development work of production techniques have been toward increasing the tensile strength and ductility of PM finished parts. "The five-and-dime powdered iron part has a tensile strength of something like 20,000 to 40,000 psi," says one engineer. "With just the shaping and sintering operations, PM parts are roughly equivalent to gray iron castings. With a second coining or cold forging operation, they're about equal to parts machined from low-carbon steel bar stock. For higher tensile strengths and added ductility, the basic operations of stamping and heating plus infiltrating with other metals, such as copper, are required."

Thompson Products, through these relatively simple and inexpensive methods, has produced PM parts of 110,000 to 120,000 psi. National Cash Register has achieved parts in the 95 to 97 per cent density range.

Latest Report — Latest count of the Powder Metal Association shows 80 or more fabricators of metal powder in the country which includes eight electronic core manufacturers and about a dozen captive plants. Biggest customer for PM parts thus far is the automotive industry. For more on how PM parts are squeezing into the automotive trade see p. 59.

Other big and growing PM markets are in electrical and electronic parts, where a finer and costlier grade of powder is used, in bearings, permanent magnets, appliance parts, aircraft, ordnance and, most important, structural parts for general metalworking applications. Metal usage in PM parts centers on iron, copper and the copper alloys, brass and bronze, lead, tin and nickel-silver. Other metals either in usage or being experimented with include aluminum, stainless steel and titanium.

Watch Them Grow—But watch for new markets and applications to grow quickly. Now that powder metallurgy has its foot in the metalworking industry's door, it may be approaching *your* operation.

Recession Talk? Here's An Antidote

Business and government must keep alert to adverse factors. But under secretary of commerce sees ten factors supporting future economic stability

AN ANTIDOTE for toxic depression and recession talk is Under Secretary of Commerce Walter Williams' speech given before the

WALTER WILLIAMS
. . . ten reasons for optimism

Sales Executive Club in New York.

Using the theme, "Why I Am Not Afraid," Mr. Williams lists sound factors of our economy and said that these, coupled with an alertness to adverse factors, give no reason for measuring the foreseeable future with other than sober, quiet confidence.

Barometers Up—Factor number one is that most barometers measuring the health of the current business activity continue to point to an active national economy. (For STEEL's analysis of fourth-quarter business, see p. 63.)

The population growth of 19 million during the 1940s and the estimated 28-million growth expected in this decade is also a strong influence for a continued strong economy, he explained.

Insatiability—Mr. Williams says that the insatiable desires of people give impetus to their productive capacity. Then salesmanship to make the person go into action to satisfy those desires comes into play. Referring to the return to a "buyers' market," he said, "Our business economy will find a rebirth of a powerful selling program, the quality and intensity of which have sharply lagged during this decade."

This nation's research in the technical field, manufacturing and marketing has provided many lifts to our economy. Pointing out that we are on the threshold of the development of atomic power, Mr. Williams predicts developments in the next 20 years which will "outstartle" those in the past 20 years.

Diversity—Another point emphasized by the under secretary is that the diverse nature of the national economy with its varied geography, population and kinds of business is a strong supporting factor for stability. Some segments experience difficulty at times, and business and government should be on guard against having two or more major segments being hit at the same time.

The Aladdin's Lamp of the economy is our productivity. To the extent that we learn to increase the output of our goods and services per capita, to that extent do we increase our standard of living.

Dollar Value—Mr. Williams cites Treasury Secretary George M. Humphrey's "honest dollar" program as another reason for confidence in the future. Three areas in which steps are being taken in the program are balancing the budget, letting the Federal Reserve System operate without domination by the Treasury department and placing more of the national debt on a long-term basis.

The slow rather than fast decline in defense expenditures which omits any sharp or sudden impact on the economy allowing business to adjust in gradual changes is another factor favoring the economy, Mr. Williams points out.

Getting Smarter—The concluding factor is that the nation is better informed about those things

having a direct bearing upon the health of the national economy. "The fact that we are better informed . . . makes us more sensitive to ups and downs, but nevertheless we are probably more prone to act in a manner to guard against unwise actions . . ."

157 Contracts for Small Business

Defense contracts totaling over $9.3 million were awarded to small companies during the Small Business Administration's first month of operation, William D. Mitchell, administrator, announces.

The 157 individual contracts involved brought the total to 3150 contracts for more than $376 million in defense contracts awarded to small business since May, 1952, when the program was begun under the former Small Defense Plants Administration.

SBA Opens Loan Doors

Flexible interest rates and a preference to military and essential civilian goods producers are the chief factors in the Small Business Administration's new loan policy.

With the Reconstruction Finance Corp. ending its lending activities today, the SBA will be ready to accept small business loan applications tomorrow, Sept. 29, William D. Mitchell, SBA administrator, states.

Loans may be made directly to small businesses or through participation with banks. Loans are not to exceed $150,000 to any one borrower; and if financial assistance applied for is otherwise available on reasonable terms, the application will be denied.

The policy board, composed of Treasury Secretary George M. Humphrey, Commerce Secretary Sinclair Weeks and Mr. Mitchell, directs that interest on loans will be charged at rates that are appropriate, taking into account all the circumstances. The interest will not exceed the legal rate permissible under applicable state law.

SBA will give preference to granting loans "which will assist, expedite, increase or maintain production necessary to meet military, defense or essential civilian requirements." All loans shall be of sound value or so secured as reasonably to assure repayment.

Treasury Studies 6-Per-Cent Sales Tax

Government is looking for some way to fill gap left by expiration of excess profits law and cutback in income tax. This could be it

LOOK for Secretary of the Treasury George Humphrey to ask Congress to pass a 6 per cent general retail sales tax, instead of the previously-discussed 5 per cent levy, to recoup the $6 billion annually the government will lose when it allows the excess profits law to expire and cuts back personal income taxes on schedule at the first of the year. But don't bet on Congress passing the tax.

GEORGE HUMPHREY
. . . one reason for new taxes

When Secretary Humphrey assured the American Bankers' Association last week that the administration would not stand in the way of the cutbacks, it focused attention on the program to be submitted to Congress in January. Present Treasury department plan is to submit a report on all tax proposals that have been considered since February and leave it to Congress to determine what it will do. The sales tax would be one of those proposals.

Alternative—An alternate plan in the hopper now is a manufacturers' tax of 6 per cent which would also cover the expected $6-billion loss next year. It is believed that Treasury officials prefer the sales tax for two main reasons.

First, it would cost less to collect the tax at the retail level and involve less administrative difficulties than a tax at the manufacturers' level. Second, an across-the-board sales tax would make the public more conscious of the taxes it is paying as opposed to the hidden-tax concept. Some officials think this would be good for the country.

Amortization Break—It seems a certainty that the Treasury department will recommend a more flexible and liberal policy on depreciation, allowing all manufacturers shorter periods to write off their capital expenditures. A reform which would allow new firms to write off the capital expenditures within the first five years—usually the critical period for a new company—is getting special attention.

Treasury officials also are concerned about tax-free state and municipal securities. At the beginning of the year, $28 billion in such securities were outstanding, and with the rate of investment in them accelerating, the total could be about $33 billion before the year end. Officials believe that without the tax-free attraction, much of that money would go into financing new and expanded industries, thus adding permanently to the nation's economic strength.

Possible Cure—Therefore, Treasury department is studying proposals which would allow the government to tax all state and municipal securities.

Another proposal under consideration is an upper limit of 10 per cent on excise taxes, with the exception of liquor which would remain unchanged. This plan would put the tax on all luxuries, replacing the 20-per-cent levy on some items now scheduled to expire this year and next.

Tongue-in-Cheek—But don't expect all of this to come to pass. Many members of Congress face campaigns for re-election next year during which they will be judged largely by what they do regarding taxes.

BLACK AND TIN PLATE SHIPMENTS FOR CANS

(tons)

	Black		Hot dipped		Electrolytic		Total	
		First half		First half		First half		First half
	1952	1953	1952	1953	1952	1953	1952	1953
Cans, sanitary	74,196	20,189	877,871	429,549	1,362,456	835,941	2,314,523	1,285,679
Cans, general	520,206	204,541	92,084	46,099	854,302	695,992	1,466,592	946,632
Closures	3,916	955	3,582	2,765	249,698	169,067	257,196	172,787
TOTAL							4,038,311	2,405,098

Source: American Iron & Steel Institute

New Uses Boost Canmakers

"TIN" CANS for everything from root beer to powdered iron are rolling off the canmakers' production lines so far this year at a faster clip than ever before; 1953 as a whole probably will equal the record-output year of 1951. It may even be better.

Prospects for continued high-level manufacture of this common commodity are also brighter than ever as the United States continues its trend toward urbanization and the industry steps up its research for newer and better uses of cans. This year, slightly less than 34 billion cans will be opened to dispense about 1500 food and nonfood products. How many containers will be produced next year is still an unknown quantity, but it is certain that the number of products will be increased considerably.

Can Age—The industry spends about $8 million a year to find new ways to put things in metal containers. Largely because of this, tin plate production until recently has been kept at near-capacity levels, as seen by the table above. About the only damper on tin plate manufacturers' enthusiasm is the fact that much of the research is aimed at reducing the dependence of canmakers on tin, practically all of which is imported.

The tinless tin can, development of which was spurred by World War II, is becoming more common in old as well as new product lines. For several years, many oil companies have been using a special "black iron" for quart-size cans. The problem of soldering is now solved for the short seam, but as yet the five-quart container must still be tin plate because of the longer seam. Some manufacturers still prefer the better appearance of the tin product, but nevertheless, by the end of the year, practically all quart tin cans for oil will be replaced by the lacquered steel can.

Future Possibility—Another development worth watching is the use of aluminum for cans containing sea foods, milk products and many dry goods. Being developed extensively in Canada and Europe, the trend is almost a certainty to reach the United States in 1954. For those products which can use aluminum cans, a great savings in weight will be a determining factor in the shift.

But those developments do not worry the conventional canmakers too much. They point out that new uses of their products will offset any inroads made by other types of containers. For instance, Continental Can Co. on the East coast and Pacific Can Co. in the West are experimenting now with canned soft drinks. Six and twelve-ounce cans have been designed to hold root beer and the cola drinks much as they do beer. Most of the cans in the East are of the cone type which require crown caps, while Pacific Can is developing a flat-top can. Pacific Can believes that if the canned soft drinks catch on with the public, a new market for the containers will be developed which will equal or surpass the beer can market.

Canned Iron—One of the greatest potential industrial applications is the use of cans in packaging powdered iron such as that used in making bearings. Other efforts are being made to can component parts for easier shipping.

While all of those applications will help to keep sales up in the future, canmakers are relying on the old standbys to sustain production the rest of this year. Some tin plate mills report activity down by as much as 40 per cent. Part of this is because of seasonal fluctuations in food canning. But condensed milk, which is the largest single user of tin cans, will remain steady and consume about 75 million cases of 24 cans each this year. Pressurized cans and frozen fruits and juices also should remain fairly level.

Caught with Stocks Up—But one of the biggest reasons for the decline in mill activity is that early this year can manufacturers bought heavily in anticipation of a steel strike. When it didn't occur, they cut back on mill orders in order to eat up inventory and have a better financial picture at year end.

Therefore, with production figures at midyear running ahead of a year ago and no drastic falling off in sight, tin plate makers and can manufacturers are settling back and looking for new products that they can can.

Tin Plate Expansion Planned

Certificates of necessity for accelerated tax amortization for 81 new or expanded facilities were issued by the Office of Defense Mobilization from Aug. 27 to Sept. 9. The certificates were for projects totaling over $39 million and

brought the total granted by ODM to date to more than $28 billion.

The largest certificate was issued to the Tennessee Coal & Iron Division of U. S. Steel Corp. for an $8.5-million expansion of electrolytic tin plate facilities in Fairfield, Ala. Rapid tax amortization allowed was 40 per cent.

Steel Wages Up in July

New highs in average hourly earnings, total employment and monthly payroll were chalked up in the iron and steel industry in July, American Iron & Steel Institute reports.

The wage earner's rate averaged $2.31 per hour in July, first full month on the new scale, compared with $2.263 in June. In the first five months the average was $2.211. Wage earners worked an average of 38.1 hours per week in July.

Estimated total employment for the month was 696,000, up 5800 from June and 11,600 from the end of last year.

The industry had an estimated payroll of $288,052,000 in July.

Tool Orders, Shipments Up

New orders and shipments of machine tools from about 350 machine tool builders increased in August over July, reports National Machine Tool Builders' Association.

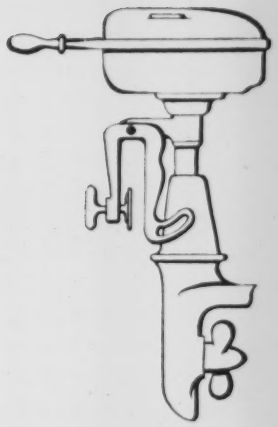
The former stood at $85 million for the month, about $12 million over July, while shipments amounted to $89 million, or approximately $10 million more than the previous month. But more important is the fact that fewer of the new orders were canceled. The 1953 average of cancellations is pegged at 11.6 per cent, but for August it was only 5.6 per cent. That left tool builders with an unfilled-orders-to-production-rate ratio of 7.3 to 1, which means that at the present demonstrated production rate, the industry has over seven months of business on the books.

Tool builders are expected to ship over $1.2-billion-worth of goods this year as compared with a little over $1.1 billion last year. New orders before cancellations will probably reach $900 million, or $157 million less than 1952.

OUTBOARD MOTOR SALES

1953	$70,000,000*
1952	$46,129,000
1951	$38,389,000
1950	$41,037,000

* Estimated
Source: Department of Commerce



Outboards: More Zip Expected

OUTBOARD MOTOR makers have been riding the boom-tide since the metals shortage disappeared and are churning up a record volume of sales which is expected to hit $70 million this year.

With the 1953 boating season rapidly drawing to a close in most areas, September is the month when many outboard manufacturers begin working on their 1954 models. Industry officials are optimistic about the future and believe that the current uptrend in outmotor boating will continue.

Up and Down — A pent-up demand for outboard motors following World War II launched the industry into a near $50-million volume for two or three years. Then the Korean war with its metal restrictions dropped production back until sales dipped to $38.3 million before rising again in 1952 to over $46 million.

Chief factors in the upsurge in popularity of motor boating, industry officials report, are increased leisure time, higher incomes, increased interest in fishing and greatly improved motors. Outboards in the 5 to 7.5-hp class are the most popular because of their cost and portability.

Approximately 14 manufacturers in the industry consume an estimated 50 million pounds of aluminum annually plus other amounts of copper and stainless, carbon and alloy steels.

Something New—Outboard, Marine & Mfg. Co., Milwaukee, Wis., announces that its 1954 Johnson 5.5-hp motor made by its Johnson Division in Waukegan, Ill., will operate so quietly that normal conversation can be heard in a boat even with the motor at full throttle. Probably the single most important feature of recent motor developments, according to Scott-Atwater Mfg. Co. Inc., officials is the gear shift which gives the operator complete control of the boat at all times. Other features which have helped popularize outboard motors include twist-grip throttles on the steering arm, remote gasoline tanks and various propeller-protection devices. Current aim of the outboard makers is complete elimination of noise and boat vibration.

With popularity of outboard motor boating apparently still on the increase, the future for outboard motors looks bright. "Even if things do slow down," one maker said, "new models will help the industry keep sales going up stream."

Railroads Add 1565 Locomotives

Coming down the stretch in their dieselization programs, Class I railroads installed 1565 new locomotives in the first eight months of 1953 as compared to 2188 in a like period last year. Of the new locomotives, 1550 are diesel-electric, 11 steam and four gas turbine-electric.

That left Class I railroads with 409 new locomotive units on order as of Sept. 1 compared with an order backlog of 1192 at the same time in 1952.

Brains Go Mechanized

Instruments designed for more important role in industrial operations

THERE'S LESS and less reason for any industrial operation to be on a "by guess or by gosh" basis. That was shown at the Eighth National Conference & Exhibit of the Instrument Society of America last week in Chicago.

Emphasis in the show was on new products, and practically every one of the 200 exhibiting companies had something new. Exhibits of industrial instruments ranged from common little dials that anyone could read to large "think" machines that in a few seconds solve problems that an army of "slipstick" men couldn't do in a year.

Growing—Indicative of the growing importance of instruments in industry, the Instrument Society of America, with headquarters in Pittsburgh, has grown steadily every year from 1946 when it had slightly more than 1000 members to the beginning of 1953 when the roster numbered approximately 5500.

Most every phase of industrial instrumentation was looked into through approximately 90 technical papers presented at the five-day conference. To help instrument men and apprentices keep abreast of the rapid strides in instrumentation, the society preceded its conference with a three-day clinic on instrument maintenance. Instrument makers provided enough instructors to take care of 400 students.

No Yak—The Instrument Society is naturally not one to overlook the use of instruments. In its exhibit areas it used industrial television for paging, thus eliminating the customary "yakety-yak" from loudspeakers. To find out whether you were being paged, all you had to do was look occasionally into a television receiver.

Business: 'Rolling Readjustment'

There is little evidence as yet that readjustments in major sections of the economy will be cumulative and foreshadow a major downturn in business activity in the immediate future. This is the opinion of Martin R. Gainsbrugh, chief economist, National Industrial Conference Board, who spoke before the 55th annual meeting of the National Foundry Association in New York, Sept. 17-18.

"In the light of the favorable financial status of the average individual consumer and its outlook for long-term growth, I think we

W. SUMMERFIELD BRUNK
. . . National Foundry Assn. president

are entitled to hope that the transition ahead will warrant the title of a 'rolling readjustment,' rather than a serious or major recession," he said.

Various other subjects relating to problems of foundry management were discussed by the group, which re-elected as its president W. Summerfield Brunk, president, Headford Bros. & Hitchins Foundry Co., Waterloo, Iowa. Other officers re-elected are: Vice president, W. W. C. Ball, vice president, Taylor & Fenn Co., Hartford, Conn., and treasurer, Frank J. Sherwin, president, Chicago Hardware Foundry Co., North Chicago, Ill. C. T. Sheehan is executive secretary with headquarters in Chicago.

Navy Yard Jobs To Drop

Navy yard employment is to be cut by some 11,000 workers during fourth quarter of 1953 and first quarter of 1954. Main reason is the new Navy policy of shifting more of its ship construction and repair work to private yards.

Suburban Selling

Harrington - Wilson - Brown Co. sets up a permanent machine tool display

SUBURBAN SELLING could be the formula of the future for machine tool distributors, who today account for 75 per cent of tool dollar volume and 95 per cent of the units sold in this country.

Advantages—Look at the advantages it will bring to Harrington-Wilson-Brown Co., which last week after 30 years in mid-Manhattan completed an exodus to outlying Mount Vernon, N. Y. By the move the company has been able to:

1. Quadruple its space while lowering overhead costs.

2. Be closer in travel time to its customers and sales personnel in eastern New York, northern New Jersey and Connecticut.

3. Provide facilities for displaying machinery in operation at all times.

4. Have a place to become better acquainted with its customers, away from the city's hectic rush.

Eye To Sales—Establishment of the tool showroom is "an innovation in the metropolitan area," says John H. Daum, general sales manager. "We now have something more than catalogs to show customers. They want to see the machines in operation and see what they can do. We'll be able to feature new machines as they are developed, too."

Week-long opening ceremonies Sept. 21-26 at the $400,000 air-conditioned and soundproofed showroom-office building found customers enthusiastic and responsive. "Practically all the 34 machines on the floor were sold on the first day of the show," says Mr. Daum. His company represents 23 manufacturers of noncompetitive metal cutting and sheet metal equipment.

Plus Service—Bonuses to customers possible with the increased space include a large conference room equipped for showing motion pictures and slides and a special engineering department to lend assistance in plant layout and workload statistics. Spare parts can be stocked on the premises.

Office facilities are geared to modern sales efforts too. Auto-

matic machinery keeps tabs of all accounts, classified as to location, potential and frequency of calls to be made by outside men. Company sales staff has doubled in the past two years.

Be Aggressive—"This is our way of fortifying ourselves for the future," sums up Dan Harrington, general manager. "The sellers' market is gone and buyers are in the saddle."

He's not at all glum about machine tool prospects though. "The replacement market is here—all you have to do is go out and sell it," he says. "Be aggressive and progressive."

Productivity Sits on Prices

Price hikes for machinery and equipment except electrical have been less than for many other industrial products and wages. Increased productivity given credit for good showing

MACHINERY AND EQUIPMENT manufacturers have actually lagged behind in price increases relative to the hikes in materials and services going into their products.

And that spells real progress in productivity for the industry passed on to its customers.

Now It's Told—Recently published price data compiled by the Bureau of Labor Statistics led Machinery & Allied Products Institute to formulate the table shown below. The table shows that, while prices of all commodities (other than farm and food) increased 97.6 per cent from 1939 through July, 1953, and wages in the machinery and equipment industries (other than electrical) increased 161.4 per cent over the same period, prices for machinery and equipment rose only 75.5 per cent.

In fact, machinery prices rose less percentagewise from 1939 to 1953 than the composite index for iron and steel (including iron ore, scrap, semifinished steel, finished steel, foundry and forge products, pig iron and ferroalloys) and the nonferrous metals index (primary refinery shapes, scrap, secondary shapes, mill shapes and wire and cable) and was two and a half times less than the increase in construction costs. Machinery prices went up about the same amount as the fuel and power index (coal, coke, gas, electricity and petroleum products).

Till Korea—The disparity between the upward movement in machinery and equipment prices and other price indexes was most pronounced before the Korean war. Then, rapid conversion to mobilization and difficulties in getting raw materials and labor forced machinery prices to fall in step with price rises in all other manufacturing fields.

Increased productivity is credited for much of the ability to hold the line in capital goods prices. In the capital goods industries today, the total wage bill is almost exactly the same percentage of sales as it was in 1939. Yet average hourly earnings have increased 157 per cent and prices only 75 per cent.

Gambits To Watch—The wage data used in the BLS analysis do not include many "fringe" benefits. Since a significant part of wage increases over these years has taken the form of "fringe" benefits, the rise in wage rates is understated.

However, the BLS does not include custom-built equipment in its index. Extras, special services, varying installation charges, etc., do not enter in the index either because the bureau is endeavoring to measure the change in price of the same machine or type of machine over an extended period of time. Since effective price changes may often take the form of changes in such services and extras and a significant volume of machinery and equipment sales as in special-design items, the BLS index misstates price fluctuations in the machinery industry to that extent.

WHERE MACHINERY AND EQUIPMENT LAG BEHIND

Percentage Change in Prices and Wages Between Selected Dates

	1939 to July, 1953	1939 to June, 1950	June, 1950 to July, 1953	July, 1952 to July, 1953
PRICES				
Machinery & Equipment	75.5%	48.0%	18.6%	2.9%
All Commodities except farm and foods	97.6	75.9	12.3	2.0
RAW MATERIAL COSTS				
Iron & Steel	111.2	76.2	19.9	10.9
Nonferrous metals	130.7	85.8	24.2	1.9
Fuel & Power	80.1	65.7	8.7	5.0
WAGES				
Machinery except electrical	161.4	112.2	23.2	6.0
Electrical machinery	152.1	106.6	22.0	6.6
CONSTRUCTION COSTS	189.7	148.8	16.4	4.5

Source: Department of Labor, Bureau of Labor Statistics. Construction costs from the American Appraisal Co. and the Department of Commerce.

Commerce's Sheaffer Quits

Resignation of Craig R. Sheaffer as assistant secretary of commerce for domestic affairs marks the departure of the first businessman in the Eisenhower official family.

His action is regarded in Washington as an outgrowth of the famous battery additive case. It was Mr. Sheaffer who earlier this year, acting as Secretary Weeks' deputy, handed a dismissal notice to Dr. Allen V. Astin, director, National Bureau of Standards. This followed disclosure that the bureau in condemning a battery additive may have acted without adequate proof. Mr. Sheaffer's resignation was tendered immediately after Secretary Weeks reinstated Dr. Astin on a permanent basis. Shifting the administrative control over the Bureau of Standards from Mr. Sheaffer to Assistant Secretary of Commerce James C. Worthy, Secretary Weeks retained policy direction himself.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

The old controversy about private vs. public power is fanning a brighter flame. Washington hearings on the matter next year will bring Congress into the debate

THE ISSUE of public vs. private power rapidly is taking the center of the stage in the controversy over the Republican-led objective of getting the government out of competition with private, taxpaying business.

Latest development is the decision of Rep. George A. Dondero (Rep., Mich.), chairman of the House Public Works Committee, to open hearings early next year on his bill to halt the "creeping socialism" of the Tennessee Valley Authority. A group of TVA supporters classes this characterization as "vicious propaganda" and is raising a publicity fund of $100,000.

Niagara Falls Again — Another attack on public power is due in Congress next session on a bill to authorize redevelopment of Niagara Falls power by a group of five private companies. Violent opposition is due from a noisy group that wants the job done either by the federal government or the New York State Power Authority.

The hottest immediate spot will be the Federal Power Commission which in October will consider the application of the Idaho Power Co. group for construction of a power dam in Hell's Canyon on the Snake river. The administration wants the job done by private enterprise, as demonstrated by the action of Interior Secretary Douglas McKay in withdrawing the intervention of former Secretary Oscar Chapman in this case. Mr. Chapman wanted the job done by the federal government.

Private Capital Absent—In its handling of the St. Lawrence river power development project, the Federal Power Commission did not consider itself faced with the issue of public vs. private power, since it was not satisfied with the financial resources of a private interest that wanted to carry out this project. Accordingly the commission has given the New York State Power Authority until Nov. 15 to accept a construction license.

Construction by New York state would be at least partially in step with the Eisenhower administration which thinks that the local people in the involved areas are in a better position to draft power plans than Washington is.

Secondary Objection—Secretary McKay points out that "so-called federal power is not the dominating factor in the economic life of the United States that some imagine." The power capacity owned by the federal government, he says, is only 11 per cent of the power capacity of the country, and this will increase to only 15 per cent after present construction has been completed. He further points out that federal production of power is a secondary function conjoined to storage of water for irrigation and flood control. He insists "it is not the primary obligation of the government to engage in the power business as such, or to assume responsibility therefor."

And he points out that the plans for public power supported in some quarters would cost many billions of dollars—which means "extension of the federal debt and the obvious necessity of continued taxes, if not actually increased taxes." Much further expansion is needed in our power generation facilities, says Mr. McKay, but it should be planned locally in the interested areas, and it should be financed with private funds.

More Renegotiation Troubles . . .

Increasing dissatisfaction with findings of regional renegotiation boards is reported by contractors, according to *Weekly Readjustment Outlook*, Washington.

Contractors' experiences tend to support the belief that the boards follow a formula of allowing a uniform percentage of profits regardless of the nature of services performed under the contracts. In many cases 10 to 11 per cent profit after renegotiation is allowed not only where the products require a high degree of skill but also where they require a minimum of skill.

Weekly Readjustment Outlook, however, advises contractors to seek fair settlements from the regional boards or from the Renegotiation Board in Washington. This is because resort to the Tax Court of the United States does not offer much prospect of relief. Not only are appeals to the Tax Court time-consuming, but also resulting decisions usually are adverse to the contractors.

Cost of Handling Steel Bars Cut in Half *with* BAKER TRUCK

JONES & LAUGHLIN DETROIT WAREHOUSE USES CRANE TRUCKS AND PORTABLE RACKS FOR MORE EFFICIENT HANDLING AND STORAGE

★ Specially designed portable sectional racks for storing steel bar and rod stock plus the use of a BAKER Crane Truck have cut handling costs by one-half at the Jones & Laughlin Steel Corporation's Detroit Warehouse. This stock was formerly stored by hand in upright position, requiring laborious manual handling. Even with overhead cranes, considerable hand labor was necessary. Previous to the purchase of the truck and the installation of the portable racks, Jones & Laughlin used 6, 8, or more men to pile steel and fill orders. The entire operation is now handled by three men.

With the Baker Crane Truck and sectional storage racks, costs have been halved—and the crane truck still has time to handle steel packs—a further saving not anticipated when it was purchased.

Illustration shows the BAKER Crane Truck handling steel bars stored on sectional racks set at 45° angles in 15 x 15 foot bays.

Documented Case History of Baker Truck savings for Jones and Laughlin is available. Use coupon below.

The Baker-Raulang Company
1259 West 80th Street, Cleveland 2, Ohio

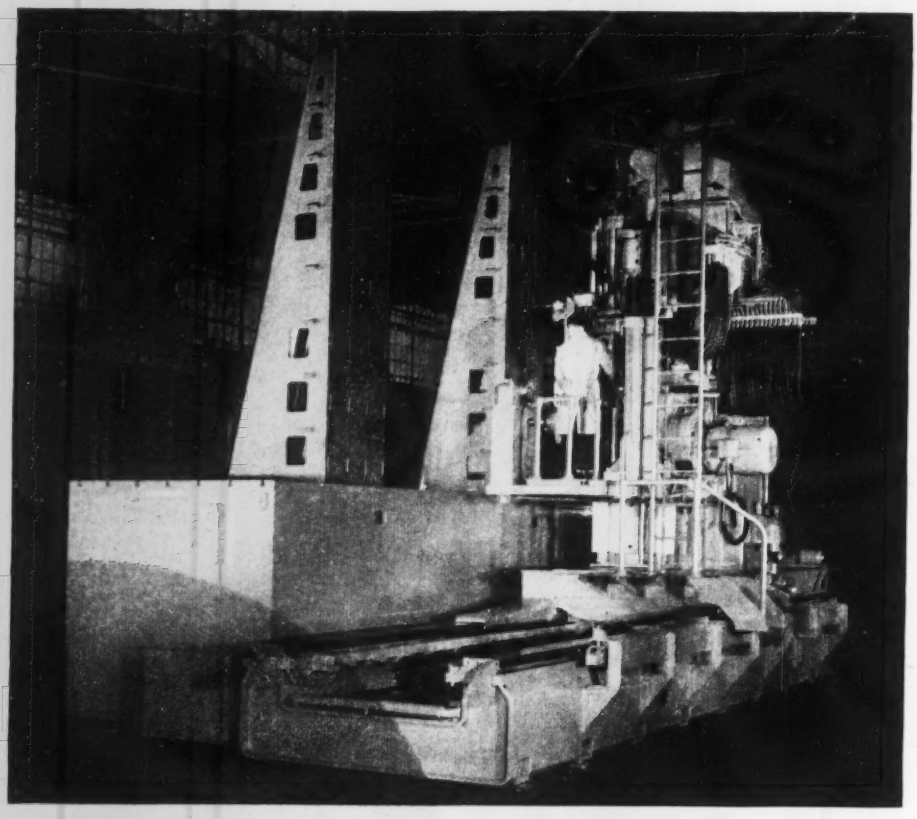
Please send me case study report No. 3051 showing savings with Baker Truck at Jones & Laughlin.

Name ..... Title .....

Company .....

City ..... State .....

Baker
INDUSTRIAL TRUCKS

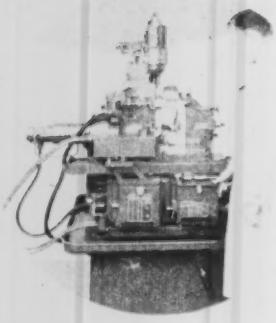


A weight of 65 tons can be supported on the table of this large CINCINNATI Horizontal Milling Machine, developed for milling large dies and general-purpose work. It is a traveling column type machine. Longitudinal traverse, 216"; vertical traverse, 72".

this familiar name plate

CINCINNATI

is attached to these extremes in milling machines



A range of 8" table travel and 2½" vertical travel on this CINCINNATI No. 08 Automatic Rise and Fall Milling Machine are just right for milling accurate hexagons on knockout punches. Production, 19 parts per hour. Visualized and tooled up by Cincinnati Application Engineers.

Elephants and rabbits* and all the in-between sizes of milling machines have been built by Cincinnati Milling for many years. The two machines illustrated here are indicative of the range of sizes. It takes long experience and extensive research and design facilities to build such a variety of machine tools. Cincinnati has this background . . . and these facilities. They are at your service to equip your shop for the lowest cost of production.

*Elephants are Washington terminology for long delivery, large machine tools; rabbits for short delivery, small machine tools.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

Cartel Sprouts in Europe

Brussels Convention now sets steel prices, fines underbidding

CAN STEEL CARTELS and a free steel market live together side by side in Europe?

The problem is posed by the growth of the Brussels Convention. Originally this convention's purpose was to merely resolve quarrels among West Germany, France, Belgium, Luxembourg and The Netherlands over prices among the steel exporters of those countries. Last August the character of the convention began to change.

Fines Fixed—Then, fixed prices were agreed upon for steel shipments to third nations, that is, countries other than those entering into the convention. A subsequent meeting fixed fines of up to $50 per ton for underbidding. Punishments are to be made by a president's committee which includes one representative of each of the five countries.

At the last meeting, limitation of exports to third nations also came under discussion.

Outside ECSC—With the influence of the High Authority of the European Coal & Steel Community limited to the common market of the six ECSC countries, the Brussels Convention agreements are beyond its reach. Within the common market such cartel agreements are prohibited, of course.

Slackening demand for iron and steel products adds impetus to efforts to eliminate price cutting among European producers, however. New rates fixed at the last meeting of Brussels Convention ran as follows:

Dollars per Metric Ton f.o.b. German port	
Merchant bars	$ 84
Joists	90
Heavy and medium plates	110
Sheets	135-149
Strip	95
Blooms	75
Billets	76
Wire rods	87

Though now only in its embryonic stage, the Brussels Convention is beginning to bear a strong resemblance to the "Internationale Rohstahlgemeinschaft" of 1926 to 1939, which laid down export quotas and fines with the difference that members were not fined for underbidding then, but for exceeding a fixed production quota.

In the Race—It remains to be seen whether Europeans' desire to become a homogeneous steel producing area or the desire by individual European nations to protect themselves against favorable steel production costs of their neighboring nations will prove stronger in Europe over the long run. One thing's sure thus far: Cartelism hasn't been eliminated.

United Press

Pop-Up Grille

New model German Mercedes features this one-piece hood and grille. The car has a four-cylinder, 52 horsepower motor and other unusual features

Reclaiming System for Japan

The first iron ore blending and reclaiming system to be built for the Far East steel industry has been shipped to Japan to be installed in the Kawasaki Steel Corp. plant at Chiba City, says Hewitt-Robins Inc., Stamford, Conn.

The system will make it possible to blend ores of different physical and chemical characteristics at a rate of about 300 tons an hour. Variations in ore grade are virtually eliminated and the mix fed into the blast furnaces makes pig iron of consistent quality.

The equipment shipped to Japan includes a reversible reclaimer, traveling boom stacker with trailing trippers, transfer car, hopper cars, samplers and weightometers.

Italy Follows Trend

Iron and steel output is falling below last year's level in Italy

ITALIAN iron and steel output, following the general world trend, is falling well below last year's production.

Basic steel production is down 11.2 per cent for the first five months of 1953 compared with the like period of 1952. Rolled steel product output is down 13.3 per cent, and for the same period iron alloy output is down 20 per cent.

In Tons—Tonnage production figures for the first five months of 1938, 1952 and 1953 compare as follows: Iron castings — 352,254, 456,291 and 461,373 tons; basic steel—1,014,886, 1,626,309, 1,443,379 tons; rolled steel products—792,411, 1,256,477, 1,092,070 tons; and iron alloys—12,438, 38,765 and 30,148 tons.

One reason often advanced for lagging production since early this year is the uncertainty arising from the organization of the European Coal & Steel Community. Italy wanted, and finally got, special import duties enforced to protect its domestic industry. The special duty will be reduced each year until it disappears at the end of five years.

In the meantime, Italy hopes to bring its steelmaking costs down, more in line with other European producers' level.

Urals Plant Makes Mill

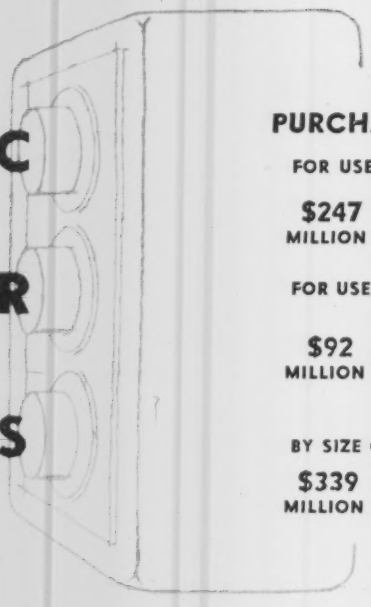
Russia's Urals Machine Plant at Sverdlovsk has made its first standard 6500-ton blooming mill with working rollers 46.3-inches in diameter. The mill is designed to roll ingots of 6 to 15-ton sizes.

This "type-1150" (rollers are 1150 millimeters in diameter) can roll both carbon steel and special steel ingots, according to the official Soviet newspaper *Pravda*. Ingots are pressed by two working rollers over 100 inches long which are capable of turning at speeds up to 10 rpm. Each working roller is driven by a separate, dc, 4500-hp motor.

The first "type-1150" blooming mill is now being installed in an undisclosed Soviet plant.

A STEEL MARKET RESEARCH STUDY

ELECTRIC MOTOR CONTROLS



PURCHASES OF MOTOR CONTROLS

FOR USE ON MANUFACTURED PRODUCTS

$247 MILLION

Machinery except electrical	92.6%
Electrical machinery	4.6%
Instruments	1.0%
Other	1.8%

FOR USE ON PLANT EQUIPMENT

$92 MILLION

Primary metals	71.2%
Machinery except electrical	10.2%
Fabricated metal products	8.1%
Electrical machinery	4.6%
Transportation equipment	4.6%
Instruments	1.3%

BY SIZE OF PLANTS

$339 MILLION

500 employees and over	65.6%
100 to 499 employees	21.2%
20 to 99 employees	13.2%

A SIZABLE sales potential lies in the metalworking field for the motor control industry, a STEEL market survey indicates.

Sales of motor controls hit nearly $369 million in 1952, Commerce department statistics show. Sales are still running high although some feel that the peak may be reached since industrial expansion has hit its peak.

Where to Aim — Returns from 2000 questionnaires sent to the metalworking industry indicate that about 29 per cent of the plants do not use motor controls. With the motor control industry seeking to maintain its present-level volume, this 29 per cent should provide a good market at which to aim.

The largest percentage of plants not using controls is in the small-plant group—only 64 per cent of the 20 to 99-employee plants use controls compared with practically all of the over-500-employee plants. Two possibilities for this are indicated: Either the small plants do not have use for motor controls or manufacturers are not stressing sales enough in this field because the largest volume of sales is with the large plants (see table above). The answer probably lies somewhere between the two possibilities.

The Big Buyer — Metalworking industries account for about $339-million of the total motor control sales. Within the metalworking industry, the machinery manufacturers purchase over 70 per cent of the controls, followed by primary metal producers with 20 per cent, electrical machinery makers 4.6 per cent, metal fabricators 2.7 per cent and producers of transportation equipment (other than automobiles and aircraft) and instruments with over 1 per cent each.

The table above gives the breakdown in the volume of controls going into plant equipment and that used for installation on manufactured equipment. Machinery manufacturers take most of the controls going on manufactured equipment and the primary metals producers buy the most controls for plant use.

Improvements Sought — Questionnaire respondents also indicated what improvements in motor controls they would like to have: More standardization of controls and interchangeability of parts, smaller and more compact units with a higher mechanical life, greater accessibility and simplification of parts for servicing.

Over 81 per cent of the plants report that they purchase their controls directly from the manufacturers, 12.7 per cent buy from jobbers and supply houses and 6.2 per cent from other sources including agents and construction contractors.

Buying Influences—To meet competition in 1954, the survey indicates that motor control manufacturers should direct their advertising and sales efforts at management, production, engineering and purchasing personnel. There are two or more men making the buying decisions in over two-thirds of plants purchasing controls for plant use and in over 83 per cent of plants buying controls for installation on manufactured equipment.

○ STEEL *has presented another in its series of market research studies designed for management in metalworking industry. Watch for the next soon.*

AEC Orders Atomic Engine

Westinghouse Electric Corp. has an order from the Atomic Energy Commission for an atomic engine that may cost up to $70 million.

Rep. W. Sterling Cole (Rep., N. Y.), head of the joint Congressional Atomic Energy Committee, said the company will be paid $7-million to start on the power plant, but that the completed cost of the engine may run to ten times that

figure. Details of the project are still a carefully kept secret, officials state.

Westinghouse is currently building a multimillion-dollar plant to make parts for atomic-powered machinery in Harmar township, near Pittsburgh.

Another Steel Home Entry

United States Steel Homes Inc., subsidiary of U. S. Steel Corp., is making a bid for the western housing business.

Initial phase of the campaign began in Salt Lake City, Utah, during National Home Week, Sept. 20-27, when the company's three-room steel home, "Western Horizon," was shown.

Priced to sell in the $11,250-$11,700 range, the steel home is currently being built in New Albany, Ind. Another plant where the homes will be fabricated is nearing completion in Harrisburg, Pa.

L.A. Boasts of Growth

Looking for new markets?

Los Angeles now has 600,000 workers employed in over 11,000 manufacturing plants, according to a survey by the L.A. Chamber of Commerce Industrial Department.

Aircraft manufacturing is still the backbone of the area's economy, of course. About 176,000 persons are employed in this type of work at nearly 6000 plants worth $307 million.

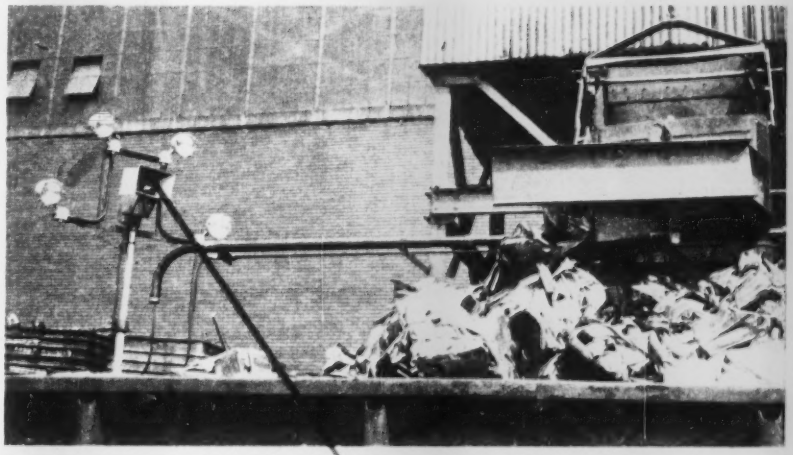
But did you know L.A. also ranks first nationally in the manufacture of oil tools and oil field equipment, pumps and compressors, refrigeration equipment and machinery, and heating and plumbing equipment? It ranks second to Detroit in automobile and truck assembly and third or better in 26 other industries.

Since 1947, 687 new plants employing 30,000 persons have gone up in the area with 75,000 additional jobs created by the 2059 plants that increased their capacity. During 1952, 73 new plants totaling $330 million in valuation were opened.

According to the L.A. analysts, industrial growth of the area springs from new markets created by the growing population and skyrocketing freight rates.

INDUSTRIAL TELEVISION

Monitors Scrap Metal Carloading

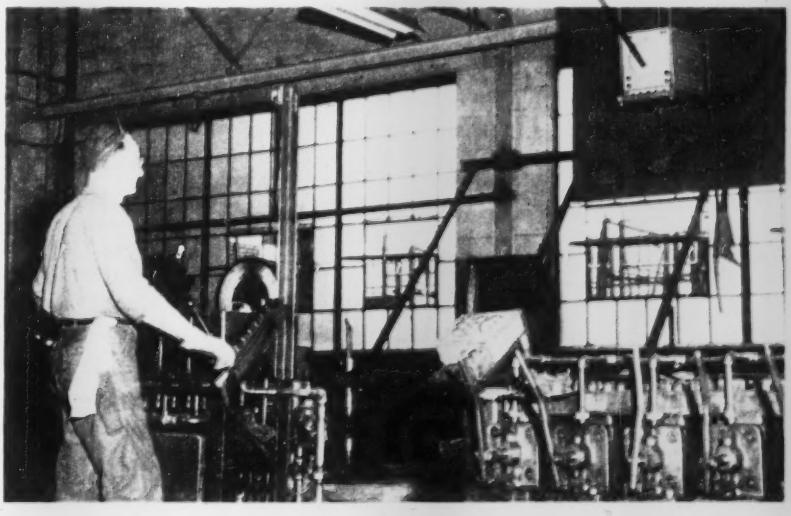


Television camera is focused on gondola car being loaded with scrap metal

GAINS in both efficiency and safety have been achieved by a television hook-up at the Cadillac Motor Car Co. plant, Detroit. A television camera focuses on the outdoor area where railroad cars are loaded with scrap coming from the scrap metal baler. The receiver is mounted inside the plant above the baler so that the baler operator can follow the progress of carloading without moving from his post at the baler controls.

When a railroad car has been loaded to a certain point, the baler operator has the car moved so that it does not overflow and create a safety hazard.

Scrap metal baler operator follows progress of carloading with his TV receiver



for **High Strength** and

Longer Life in

Farm Implements

Specify

N-A-X

HIGH-TENSILE STEEL

N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made stronger . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — **Ecorse, Detroit 29, Michigan**

NATIONAL STEEL CORPORATION

KEEP YOUR SCRAP MOVING TO YOUR DEALER

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

From Chrysler's Amplex Division presses, typical metal powder parts . . .

Compressed powder—in metal form—has been the aspirin tablet that has relieved many an auto production headache. Your car contains up to 75 powdered metal parts

DETROIT

ABOUT 25 YEARS AGO hard-to-lubricate squealing clutch pilot bearings were a headache to Chrysler Corp. Appropriately enough, the headache cure was physically similar to an aspirin tablet—compressed powder.

The powder in question, however, was a copper-base alloy which when compressed into a bearing could then be oil-impregnated due to its porosity. So well did these bearings keep their powder wet that they were quickly utilized in the water pump, another chronic squealer, and as the 1930s progressed so did the use of powder metal parts among the automakers.

The Big User—Today it is estimated that 50 to 60 per cent of powdered metal parts production goes to the auto companies. Your car may contain as many as 75 powdered metal parts. Among them are bearings for the starter, generator, distributor, transmission, differential, steering column, convertible top linkage, wiper motor, heater motor, etc. These are the direct, prelubricated descendants of that original bearing.

But many of them are working parts like shock absorber pistons, oil pump gears, transmission gears and governor weights, hydraulic pump parts and door latches. For powdered metal is rapidly coming into its own as a fabrication technique that cuts costs as slickly as it lubricates. The quantity of powder metal parts used by the auto industry is up over 100 per cent since 1945 and their use is still growing.

Savings—Like diecasting, which is also taking over production of many parts that formerly were machined, powder metal parts offer substantial cost reduction to their users. Amplex Division, Chrysler Corp., Detroit, reports typical savings of 20 to 70 per cent on most machining jobs replaced with powder metal on labor and materials alone. In one case an auto manufacturer discovered that replacement of a ball bearing assembly costing $0.40 with a powder metal bushing costing only $0.08 gave substantially superior results.

And how is a typical bushing made? In most cases two simple sets of tools are necessary: A briquetting set consisting of a core rod, two punches and a die; and a similar set of tools for sizing. Metal powder of about 150 mesh is placed in the die cavity and the punches transmit a hydraulic pressure of about 15 tons per square inch. Under this pressure the powder is compressed to about two-fifths its former volume and is ejected from the press as a briquette. Even at this point the part will not be damaged by normal handling though it will fracture if squeezed tightly.

Procedure—To establish a fused bond the part is next sintered in a furnace at temperatures in the vicinity of 2000 degrees F, at which temperature the extremely thin edges of the powder metal particles bond together though the part itself does not melt. It can be appreciated that careful temperature control is required to control the degree of fusion, and when the part has been sintered final dimensional accuracy is insured by placing the part in a finish die and striking it to size.

So accurately does this method perform that tolerances over-all of 0.0003 (plus or minus 0.00015) can be held on small bushings, 0.001 on bushings up to 1½ inches in diameter and 0.0015 on bushings up to 2½ inches in diameter at an average finished part speed of 300 units per hour. In automotive applications most parts range from ¼ inch in diameter to about 3 inches in diameter, a size ideally suited to powder metal volume production, though production parts as large as 18 inches in diameter have been produced quite successfully.

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Iron Catches Up — During the prewar years ferrous base alloys were in the minority among the tonnages of metal powder parts used by the automakers. Today the ferrous material equals or exceeds the tonnage of copper-base alloys in automotive applications though the number of parts per car is still dominated by the ubiquitous copper bushing. Aluminum usage is negligible in the auto industry.

A strong factor in the use of ferrous powder metal parts in addition to labor and material savings is the property of the parts themselves which makes them ideally suited to some applications. In a test of shock absorber pistons, for example, cast iron and steel pistons wore 0.011 inch while a powder metal part of ferrous alloy wore only 0.0003 inch. The most probable explanation lies in the ability of the powder metal surface to retain oil, thus reducing friction.

Outlook Bright — Spokesmen at Morraine Products Div., General Motors in Dayton and Ford Motor Co. and Amplex Division, Chrysler Corp. in Detroit agree that the future of powder metal parts in the auto industry is bright. The use of powder metal parts has not been publicized widely because the layman visualizes a powder metal part disintegrating with a puff when he steps on the starter.

Automakers recognize the limitations of the technique but point out that where powder metal is good it is very, very good. None of the Big Three were secretive about the fact that powder metal will be making news in the auto industry in the next few years. For when an auto engineer has an unusually difficult lubrication or fabrication problem, he often takes a powder.

(For more on this, see p. 45.)

Germs in Antique Cars

"The germ of almost every feature of today's cars can be found in the cars of 1900 to 1910," said B. J. Meldrum of Chrysler Corp. in addressing the Glidden tourists recently. "Many of the failures represented not imperfect design, but the imperfect manufacturing facilities then available.

"We are still engaged, for example, in trying to develop means for manufacturing economically some of the hydraulic transmissions which were conceived over 40 years ago. The Manly hydrostatic transmission of that period is still exciting engineering comments and we still look forward to the day when perfected manufacturing facilities will make its production economical."

Predicting that the cars 50 years from now will show greater contrast with today's product than those of 50 years ago, Mr. Meldrum pointed out that possible developments include electric energy absorbers replacing dry friction brakes, plastic replacing steel, alcohol or uranium fuel, year-round air conditioning for all cars and changes in car size.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	641,242	322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Aug. 22	163,635	109,588
Aug. 29	152,866	122,659
Sept. 5	132,574	111,095
Sept. 12	122,863	137,295
Sept. 19	146,517	147,748
Sept. 26	150,000*	141,228

Sources: Ward's Automotive Reports.
*Estimated by STEEL

On the Willow Run

Early last week nearly 1000 machines had arrived at Willow Run waiting to be moved into position to begin Hydra-Matic transmission production, while over 50 production machines were completely installed ready to run.

The majority of the equipment was in the die cast and centerless grinder department.

Up until this time work had been concentrated on installation of tool room equipment and steel grid below the ceiling to carry power and supply lines for the equipment. With final removal of Kaiser equipment from the plant, work to turn the empty shell into a producing plant is moving ahead rapidly, but since a shortage of one machine could hold up production General Motors is making no official prediction of probable production dates.

From the Wastebasket

National sales of Ford passenger cars broke a 23-year monthly record in August and are expected to continue at record rates throughout the balance of 1953, says L. W. Smead, Ford Division sales manager. New-truck sales for August were the best since September, 1950, while sales of used trucks during August broke all ex-Ford records.

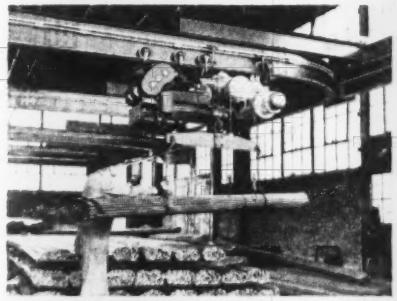
DeSoto production in 1953 officially passed that of all 1952 early this month, says J. B. Wagstaff, DeSoto vice president in charge of sales. Production for all of 1952 was 97,585 units, and the company is now eyeing its all-time production high of 127,430 cars in 1950.

A moderate decline from Michigan's recent record employment plateau is now in progress, says the Michigan Employment Security Commission. A series of temporary and indefinite layoffs in a number of consumer durable goods lines during the past 60 days marks the adjustment of production to consumer demand and to the changing defense production program. Some reductions are also being made from the high weekly working hours of the past year.

People would rather drive a car with Dynaflow than keep warm, Ivan L. Wiles, Buick general manager, reports that 99.3 per cent of the super series models built up to Sept. 1 were equipped with Dynaflow while only 99.2 per cent were equipped with heaters. He also disclosed that power brakes have climbed into third place at 80 per cent as the most popular option on the Roadmaster series, outranked by the heater and radio only. Dynaflow, however, is standard on the Roadmaster.

Monroe Auto Equipment Co. which this year announced a new power steering unit of the linkage type, reports that the device is being delivered to six automakers for use on 1954 models.

MONORAIL Pays!

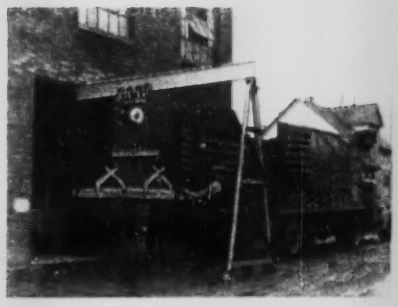


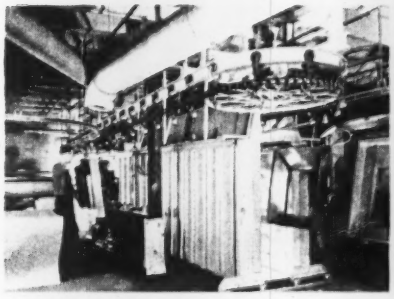
INCREASES TONNAGE

From 26 to 48 tons of steel rod per day was the increased movement produced by a properly engineered monorail system.

LOWERS COST

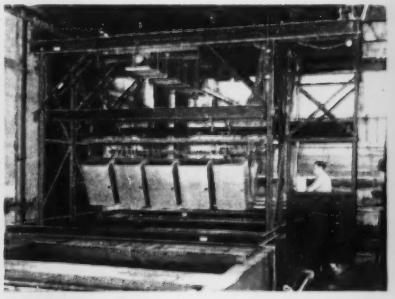
This simple system actually saved $150 in handling costs within four months of operation. No more sheet-by-sheet movement.





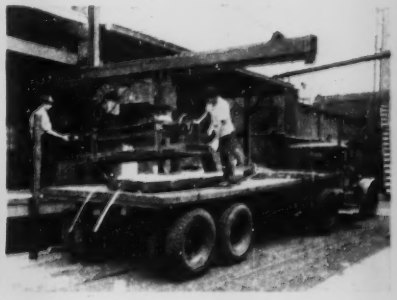
SAVES TIME

Passage, on monorail, of metal parts through infra-red dryer, cuts 70% from former drying time. All other handling in plant on monorail.



MORE CAPACITY

30% more capacity was added to metal cleaning process by handling a third more units on carrier with one man operation from cab control.



LESS LABOR

Operators claim to save 26 man hours per truck over former unloading time. Interlocking monorail cranes in the plant also reduce handling costs.

Write for Bulletin C-1
showing many more cases where MONORAIL PAYS!

THE AMERICAN COMPANY

13102 ATHENS AVENUE CLEVELAND 7, OHIO

Where the finish is important...

Specify... SHARON STAINLESS STEELS

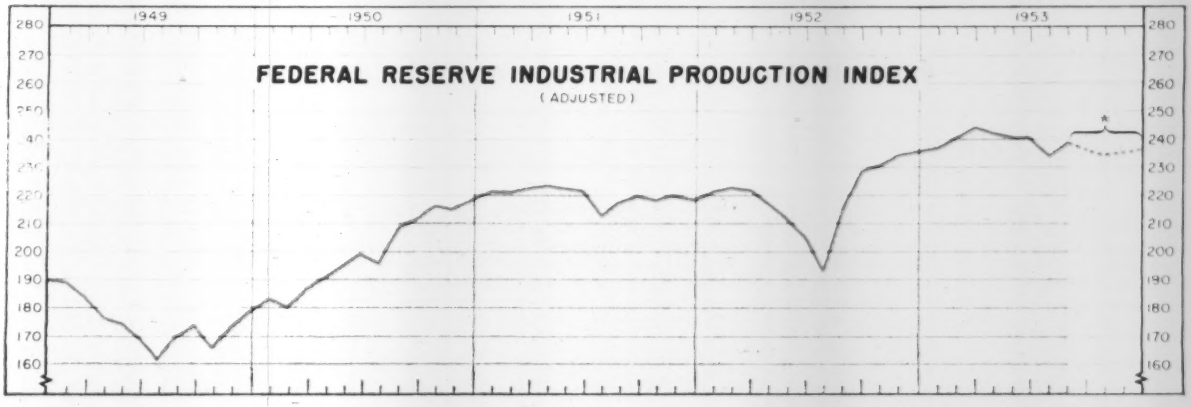
Manufacturers of products purchased essentially by women know the value of eye appeal. Jewelry . . . pots and pans . . . utensils in particular, must have appearance as well as be serviceable.

That's where *Sharon Stainless Steels* come in. Manufacturers who have shopped around will tell you that with *Sharon Stainless* you get the finest finishes available . . . finishes that make it easy to fabricate gleaming, lustrous, blemish-free and eye appealing products.

Think of your product in terms of Stainless Steel, and when you do — think of finer finish *Sharon Stainless Steels*.

Get the 430 Story — Sharon has prepared a fact-packed, fully illustrated booklet with up-to-the-minute information about 430 Stainless Steel. To get your free copy contact your nearest Sharon representative or write direct. There are Sharon offices in **Chicago, Cincinnati, Cleveland, Dayton, Detroit, Indianapolis, Milwaukee, New York, Philadelphia, Rochester, Los Angeles, San Francisco, Montreal and Toronto.**

SHARON STEEL CORPORATION
Sharon, Pennsylvania



* Estimated by STEEL

Fourth Quarter: High-level Production Continues

THE BUSINESS OUTLOOK for the last quarter compared with the first half will be—like views from the 86th and 84th floors of a building—down two stories but much the same.

As the industrial production chart above indicates, watch for a slight dip in output over the rest of 1953. But the drop will not be nearly as severe as some pessimists predict. The major reasons: New plant and equipment expenditures and defense spending will still be high, although somewhat down from peak outlays, and consumer spending will remain near the present level.

Record Expenditures — Business spending in the last three months of 1953 will be a tremendous shot in the economy's arm, even if the last quarter's expected outlays drop to a low for the year. Despite that decline, capital outlays for 1953 will hit a record $27.8 billion, compared to $26.5 billion in 1952.

Nor is another big spender, the government, yet slowing down, even though it is cutting back on many programs in moves that won't show up on U. S. financial statements for months. In August, for example, U. S. military expenditures hit $1228 million, compared to $1206 million in August, 1952. The outlays won't drop much in the last months of the year.

Buyer's Attitude — Around the end of the year—the same time that production starts to pick up—consumer spending will probably begin to rise. This can easily happen because:

Checking deposits at commercial banks will be close to the $100 billion mark, about the same as last year.

More money will be available for consumer credit since short-term business loans have fallen off; that decline results from lower industrial inventories and, consequently, a lesser need for business loans.

Installment credit levels at the current $20.5-billion mark are high, but probably can and will go higher with safety.

Owners of some of the $18.7-billion held in savings accounts may relax the grip on their purse strings.

Psychological factors for increased consumer spending, such as the expectation of personal income tax cuts in 1954, will outweigh or at least balance factors against less spending, such as persistent predictions of a depression.

Basic Indicators . . .

During 1953, most basic economic indicators will have registered a terrific year. However, they will have slipped during the third and fourth quarters. Here is the way some of them will compare with earlier in the year.

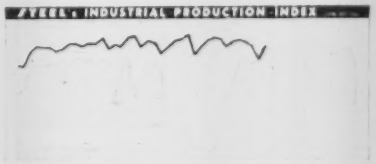
Gross National Product—Down from a seasonally adjusted annual rate of $372.4 billion in the second quarter to $370 billion in the last quarter.

Personal Income—About $1 billion less in the fourth quarter than in the third.

Industrial Production—Year end production should average about 236 per cent of the 1935-1939 Federal Reserve adjusted average. That's down about 7 percentage points from the March peak.

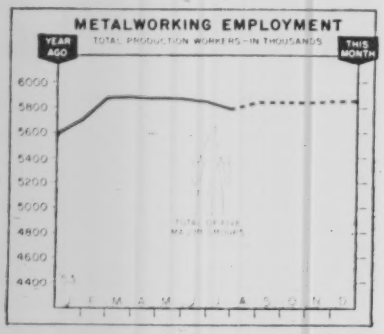
Retail Sales—Strong but level during the first half of the year, on a seasonally adjusted basis they reached an annual rate of about $126 billion. The fourth-quarter average will be only slightly less than the first half.

Business Inventories—Seasonally adjusted, their value in midyear was about $77.8 billion. The level-



● STEEL's *Industrial Production Index figures for the week ending Sept.* 19:
Latest week: 228 *Month ago:* 235
Previous week: 212 *Year ago:* 229

FOURTH QUARTER IN METALWORKING
Basic Indicators Level Off

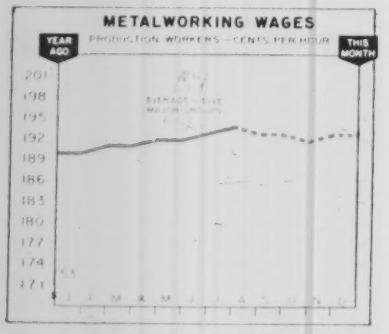


Metalworking Employment
In Thousands

Production Workers—Five Major Groups

1952	Prim. Mtls.	Fab. Prod.	Mach. Inery	Elec. Mchy.	Trans. Equip.
July	676	726	1,203	685	1,169
Aug.	1,110	783	1,381	708	1,192
Sept.	1,153	821	1,193	743	1,330
Oct.	1,162	847	1,212	766	1,389
Nov.	1,163	863	1,242	784	1,421
Dec.	1,183	881	1,283	800	1,460
1953					
Jan.	1,188	891	1,286	804	1,484
Feb.	1,142	942	1,323	916	1,543
Mar.	1,115	962	1,336	925	1,544
Apr.	1,114	962	1,321	926	1,576
May	1,138	962	1,303	921	1,576
June	1,143	968	1,299	913	1,567
July	1,133	939	1,277	880	1,574

U. S. Bureau of Labor Statistics

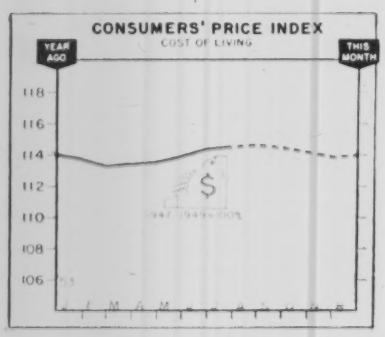


Metalworking Wages
cents per hour

Production Workers—Five Major Groups

1952	Prim. Mtls.	Fab. Prod.	Mach. Inery	Elec. Mchy.	Trans. Equip.
July	181	170	184	166	192
Aug.	193	173	185	167	194
Sept.	196	177	187	168	201
Oct.	198	178	189	170	203
Nov.	200	179	190	170	204
Dec.	201	181	192	170	204
1953					
Jan.	203	181	193	172	203
Feb.	201	182	194	173	205
Mar.	201	183	195	173	205
Apr.	201	183	195	174	206
May	202	183	195	174	205
June	205	184	196	175	207
July	206	185	196	177	208

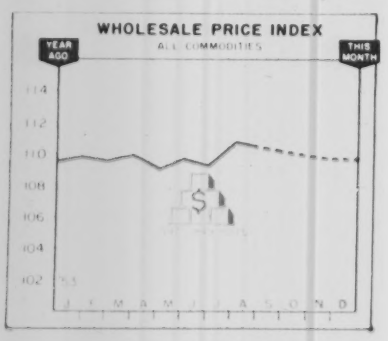
U. S. Bureau of Labor Statistics



Consumers' Price Index
(1947-1949 = 100)

	1953	1952	1951
Jan.	113.9	113.1	108.6
Feb.	113.4	112.4	109.9
Mar.	113.6	112.4	110.3
Apr.	113.7	112.9	110.4
May	111.0	113.0	110.9
June	114.5	113.4	110.8
July	114.7	114.1	110.9
Aug.	...	114.3	110.9
Sept.	...	114.1	111.6
Oct.	...	114.2	112.1
Nov.	...	114.3	112.8
Dec.	...	114.1	113.1

U. S. Bureau of Labor Statistics



Wholesale Price Index
(1947-1949 = 100)

	1953	1952	1951
Jan.	109.9	113.0	115.0
Feb.	109.6	112.6	116.5
Mar.	110.0	112.3	116.5
Apr.	109.4	111.8	116.3
May	109.8	111.6	115.9
June	109.5	111.3	115.1
July	110.9	111.8	114.2
Aug.	110.6	112.2	113.7
Sept.	...	111.7	113.4
Oct.	...	111.1	113.7
Nov.	...	110.7	113.6
Dec.	...	109.6	113.5

U. S. Bureau of Labor Statistics

Charts Copyright 1953 STEEL

Dotted lines show estimates by STEEL

ing-off process which started in June will continue through the end of the year. Many manufacturers are already in the hand-to-mouth inventory category.

Manufacturers' Unfilled Orders—From a peak of $78 billion, reached at the end of the third quarter last year, they declined to about $70 billion in mid-1953. Further declines in the third and fourth quarters will reduce the backlog to between $60 and $65 billion by Dec. 31.

Prices—The spot price index of the Bureau of Labor Statistics reached 135 per cent of the 1947-1949 average in the first quarter of 1951. In June, 1953, it registered about 88.5 per cent. Then in August it rose to almost 90 per cent. Since then it has slipped back due to declines in the prices of metal scrap. Further slight reductions are anticipated. The recent decline in wholesale prices should extend gently to about the year end. With merchants making every attempt to continue consumer sales, the consumer price index might well decline along with the wholesale index.

Stock Market Prices—They languish at close to the year's low now, even though this has been an excellent year for corporate earnings. A lack of future optimism which preceded the end of the Korean war caused the downturn. However, within the last two weeks there have been great increases in loans to brokers and dealers in securities. Along with purchases by corporation officials of stock of their own and other companies the downtrend should be halted. Prices will be rising by the end of the year.

New Capital Issues—New records have been set this year. Perhaps this is only the prelude to more records in 1954.

Construction — Awards have been setting new records in 1953, although residential contracts have slid downward since July. Future construction records will await an easing of bank rates. Trend for the remainder of the year will show a sharp drop.

Length of the Work Week—The work week averaged 40.7 hours in 1952. This year it may be slightly more due to the heavy production of the first half. Recent pro-

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	90.0	88.5	102.0
Electric Power Distributed (million kwhr)	8,395	7,963	7,725
Bituminous Coal Output (daily av.—1000 tons)	1,354	1,594	1,975
Petroleum Production (daily av.—1000 bbl)	6,490[1]	6,506	6,514
Construction Volume (ENR—millions)	$180.8	$321.0	$260.5
Automobile, Truck Output (Ward's—units)	146,517	122,863	147,748
TRADE			
Freight Car Loadings (unit—1000 cars)	820[1]	711	874
Business Failures (Dun & Bradstreet, no.)	182	131	145
Currency in Circulation (millions)[3]	$30,335	$30,479	$29,292
Dept. Store Sales (changes from year ago)[3]	−11%	0%	+1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,979	$12,803	$18,180
Federal Gross Debt (billions)	$273.3	$273.3	$263.0
Bond Volume, NYSE (millions)	$17.3	$9.2	$13.9
Stocks Sales, NYSE (thousands of shares)	9,168	4,538	5,425
Loans and Investments (billions)[4]	$79.1	$79.4	$75.3
U. S. Gov't. Obligations Held (billions)[4]	$31.5	$31.8	$31.8
PRICES			
STEEL's Finished Steel Price Index[5]	189.38	189.38	181.31
STEEL's Nonferrous Metal Price Index[6]	203.2	206.9	223.2
All Commodities[7]	110.8	110.4	111.8
Commodities Other Than Farm & Foods[7]	114.6	114.7	113.2

[1]Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. [4]Federal Reserve Board. [5]Member banks, Federal Reserve System. [6]1935-1939=100. [7]1936-1939=100. [8]Bureau of Labor Statistics Index, 1947-1949=100.

duction schedules have sharply reduced the amount of overtime. Present decline in unfilled orders calls for further curtailment.

Business Failures — During the first seven months of 1953 they ran about 4 per cent above 1952. Stiffer competition will speed the rise during the remainder of the year. Trend is not startling.

Business Incorporations—Their numbers set records earlier in the year. Decline in recent months has been slight, but the trend will be downward till the end of the year.

Industrial Barometers . . .

Automobile Output—During October it will dip downward from the September outturn, which was appreciably less than the peak production of the spring months. Dip will occur when GM changes models. Dealers should welcome this chance to work off high new-car stocks. Unusually favorable trades are reported from many areas.

TV Sales — Retail inventories have remained at a high level for the first time in many years. This is indicative of sluggish sales. Price reductions are presented to the buying public to reduce inventories.

Steel Operations—National operating rate will drop off a few percentage points from the present level.

Electric Output—Production estimate for December is 13.7 per cent over December, 1952. The rate of monthly gain was swollen during the summer months by the snowballing use of air conditioners. Thus the 13.7 per cent gain is more in line with the year-to-year increase in kilowatt production.

Agricultural Machinery — No real relief in sight for the farmer. His buying power has steadily declined. Sales of farm machinery have been in the doldrums all year and will remain there.

Oil & Gas Equipment—The recent cutbacks in Texas allowable production will tend to slow down the exploration of new oil fields.

Trends Fore and Aft . . .

Shipments of steel shipping barrels and drums totaled 2,859,000 units in July, down 16 per cent from June but 19 per cent higher than July, 1952, the Bureau of the Census says . . . Pump orders in July amounted to $5,532,625, the lowest month for the year to date, according to the latest report from the Hydraulic Institute.

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WOULD HAVE JUST THE SPRING STEEL

(ANNEALED OR TEMPERED)

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KENILWORTH STEEL

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You should see the spring steel department here at Kenilworth (you're invited to visit us anytime) with all the facilities to provide customer service. Many aisles of "in stock" material in the humidity and temperature controlled room shows you how fussy we are about doing the job right. And you'll find even the most uncommon spring steel types for unusual requirements. But as we said it's the role the specialist should play—meeting exacting spring steel specifications and needs—for a few pounds or many—we're doing it every day and we would like to talk about serving your requirements at your request.

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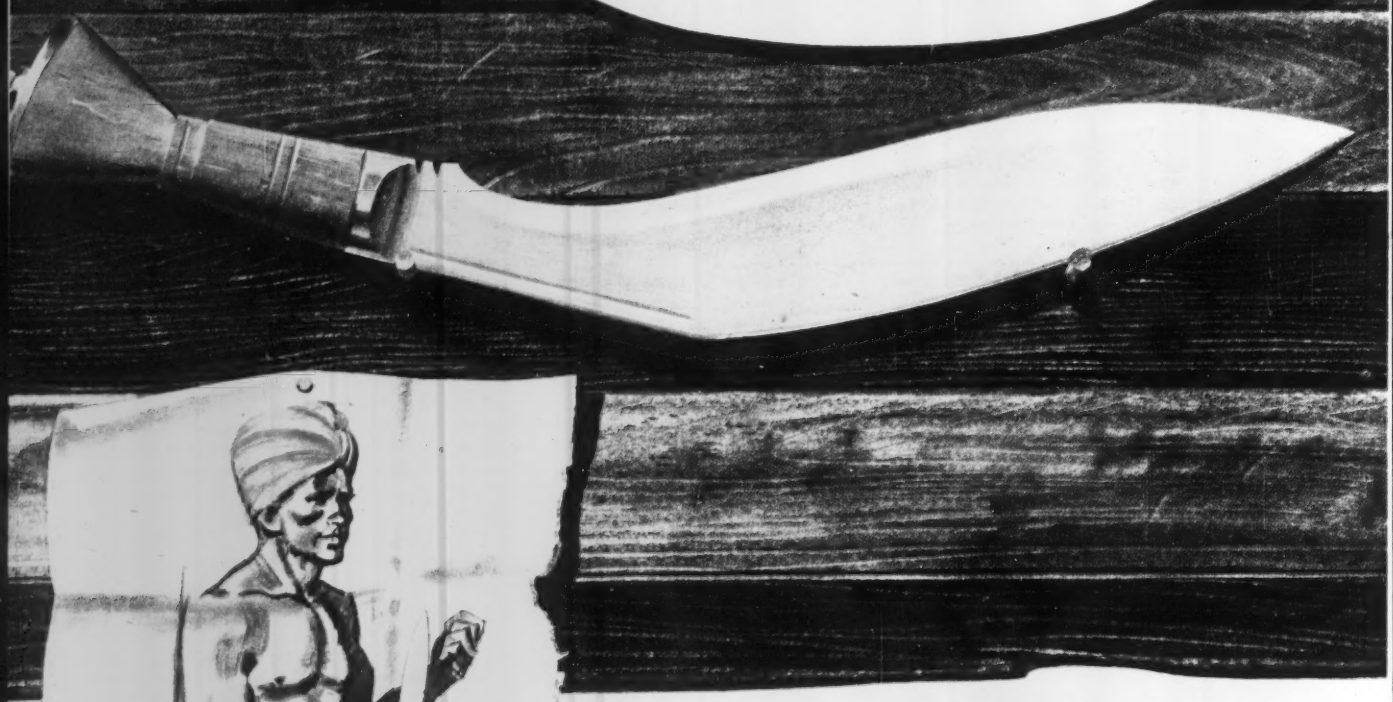

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Heppenstall Shear Knives are known throughout the Metalworking Industry for their dependable, low-cost performance. These are the blades that provide: *More cuts between grinds • More units per blade • Lower overall blade cost • Faster, more dependable production.* Make Heppenstall Shear Knives your standard specification.

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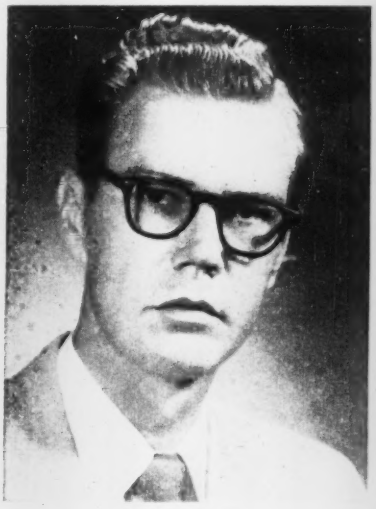
Sales Offices and Distributors in principal cities

Men of Industry

GEORGE J. SCHAD
. . . new president, Tinnerman Products



L. M. GARY
. . . directs Willys' forge sales

ROGER O. BAY
. . . v.p. of Bonney Forge & Tool Wks.

George J. Schad was elected president, **Tinnerman Products Inc.**, Cleveland. He succeeds **A. H. Tinnerman,** now chairman of the board. Mr. Schad has been with Tinnerman for 20 years. Starting as an accountant, he became successively purchasing agent and assistant treasurer. He was made treasurer and a director in 1946 and a vice president in 1952.

Levinson Steel Co., Pittsburgh, appointed **Tom L. Murray** assistant sales manager and **Sidney Moidel** office manager.

George D. Gareau was made general purchasing agent and **A. L. Modreski** manager of production for **Airway Products Inc.**, Pontiac, Mich. Mr. Gareau was recently with Ford Motor Co.'s tank division purchasing group. Mr. Modreski was with Warner Aircraft Division, Detroit Harvester Co. and Ford Motor Co. in various executive production and process engineering capacities.

Dobeckmun Co., Cleveland, appointed **Warren B. Dierking** assistant sales manager, packaging division.

Gisholt Machine Co. appointed **Rodney H. Stebbins** as district representative working out of Milwaukee.

Willys Motors Inc., Toledo, O., appointed **L. M. Gary** director of forge sales, defense division. He will direct sales of both steel and aluminum forgings. The former are produced at the Toledo plant, the latter at Willys' aluminum forge shop in Erie, Pa.

A. Harry Dahlhauser was appointed director of research at **Wire Specialties Co.**, Santa Clara, Calif., a subsidiary of Keystone Steel & Wire Co.

J. T. Dugall was appointed to the newly created position of rod, bar and wire operations manager for **Kaiser Aluminum & Chemical Corp.**, Oakland, Calif., and **C. W. Heppenstall** was made plant manager of the corporation's rod, bar and wire works at Newark, O. Mr. Dugall, formerly Newark plant manager, has been with Kaiser Aluminum since 1949.

Chauncey K. Hubbard, former vice president, Rockwell Mfg. Co., was named assistant to the general manager, container division, **Jones & Laughlin Steel Corp.** He will have headquarters in the New York offices.

Dr. Mark E. Putnam, executive vice president of Dow Chemical Co., was elected a director of **Campbell, Wyant & Cannon Foundry Co.**, Muskegon Heights, Mich.

Roger O. Bay was elected a vice president, **Bonney Forge & Tool Works,** Allentown, Pa., subsidiary of Miller Mfg. Co. He continues to serve as sales manager of Bonney's tool division, a position to which he was appointed in May of this year. Prior to that he was sales manager, automotive division, Cleveland Pneumatic Tool Co.

Pesco Products Division, Bedford, O., Borg-Warner Corp., appointed **Paul W. Brannon** vice president of manufacturing. Associated with Pesco Products since 1952, he has been more recently serving as manager of manufacturing.

John R. Woodruff was appointed Pacific Coast district manager, **Electric Controller & Mfg. Co.**, with headquarters at Los Angeles. He is succeeded as Houston district office manager by **Claude A. Mitchell Jr.**

Roy R. Buck and **Wayne L. Smith** were made assistant chief engineers of **Trackmar Co.**, a Milwaukee subsidiary of Caterpillar Tractor Co. Mr. Buck will direct equipment design and Mr. Smith will head the standards, plannings and records division.

Rotary Electric Steel Co. appointed **W. Miller Koenig** eastern district sales manager with headquarters in the New York area and **D. J.**

Connelly as Cleveland district sales manager.

Warren C. Sprague was made West Coast factory sales and service representative for **Farmers Engineering & Mfg. Co.**, Irwin, Pa.

Frank L. Snyder, vice president, **Westinghouse Electric Corp.**, has reassumed management of its transformer division at Sharon, Pa., a post he filled from 1949 to 1951. He succeeds **Chris H. Bartlett**, scheduled to direct the division's planning and management programs. Since April of this year Mr. Snyder has been on the staff of **L. E. Osborne**, executive vice president in charge of defense products.

A. C. Richardson, in supervisory charge of research in mineral processing at **Battelle Memorial Institute**, Columbus, O., for the last 20 years, was named technical director.

W. H. McConnell, director of sales at **Diamond Alkali Co.**, Cleveland, was promoted to vice president of sales. Also elected a vice president is **C. E. Lyons**, works manager of the electrochemical plant at Houston. The company also announces formation of two new autonomous divisions—the plastics and agricultural chemicals headed by **A. L. Geisinger**, a vice president, who becomes general manager of the division; and the chromium chemicals division with **Frank W. Jarvis** as general manager.

Edward K. How was made manager of sales for **General Electric Co.'s** welding department, York, Pa., and **James P. Dempsey** was named manager of employee and plant community relations. The welding department, now located in Fitchburg, Mass., transfers soon to York in a move expected to be completed by March, 1954.

Edwin P. Mynott, director of quality control since 1939 at Rochester Products Division, **General Motors Corp.**, Rochester, N. Y., retired after 38 years of service.

Orton Crane & Shovel Co., Chicago, appointed **Arthur E. LeGare** as sales engineer. He will represent Orton primarily in the industrial and railroad market.

R. E. BANSEMER

M. O. MESSENGER

. . . appointments at Koehring Co. and subsidiary, Parsons Co.

R. E. Bansemer, assistant sales manager at **Koehring Co.**, Milwaukee, was named sales manager for its subsidiary, Parsons Co., Newton, Iowa. **M. O. Messenger**, sales manager at the Iowa plant, was transferred to Milwaukee as assistant sales manager in the parent company.

Albert C. Jones was made superintendent of the plate and structural mills, **Tennessee Coal & Iron Division**, Birmingham, U. S. Steel Corp. **C. J. Porter** was promoted to superintendent of ovens and the unloading station at the by-products coke works.

Erle M. Constable was appointed assistant vice president-procurement of **Glenn L. Martin Co.**, Baltimore.

Elmer H. Wegner, former acting works manager, was made general manager of manufacturing for **Clever-Brooks Co.**, Milwaukee. He joined the firm early this year as director of purchases. He formerly was with Ladish Co. in that capacity for 25 years. Aiding Mr. Wegner will be **Glenn W. Leupold** with responsibilities of works manager.

Robert L. Stockus joined **Farrel-Birmingham Co.**, Ansonia, Conn., as assistant manager of its rolling mill division. Prior to this appointment he was sales manager of Armzen Co.

Roy C. Hobson, assistant to the vice president in charge of sales, **National Malleable & Steel Castings Co.**, Cleveland, was promoted to assistant manager, Chicago works. **Mark M. Miller**, sales manager, Indianapolis works, assumes Mr. Hobson's duties in Cleveland, and is replaced by **John H. Murphy**. **John A. Koehl** becomes assistant sales manager at Indianapolis.

General Electric Co. has established a specialty control department at its Schenectady, N. Y., works and appointed **Dr. Louis T. Rader** as its general manager. On Dr. Radar's staff will be **K. N. Bush** as manager of manufacturing; **H. L. Palmer**, manager of engineering; **J. P. Rutherfoord**, manager of marketing; and **C. S. Van Wormer**, manager of finance.

James J. Crocker was made chief tool engineer of **Chrysler Corp.'s** Los Angeles plant.

Menasco Mfg. Co., Burbank, Calif., elected **B. R. Fondren** vice president-finance and **Carl H. Kalbfleisch** vice president-services.

McGraw-Hill Publishing Co. Inc., New York, elected **Donald C. McGraw** as president to succeed his brother, the late **Curtis W. McGraw**. The new president has been with the company since 1919, a director since 1935 and vice president since 1945.

Newly elected directors of **American Platinum Works**, Newark, N. J., are **William J. Wagnitz**, general sales manager; **John F. Thompson**

For the long haul... Autocar relies on RB&W bolts

Famous truck builder rates them best for ease of assembly and accessibility

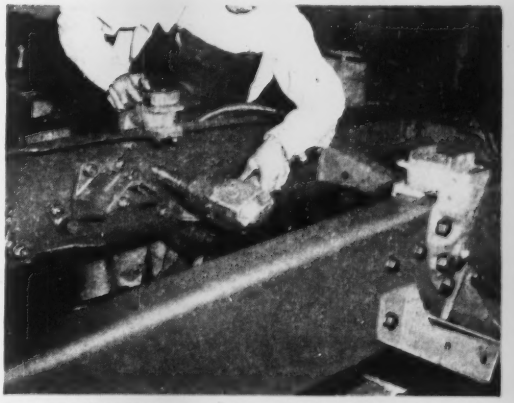
It's been a long time since the Autocar people switched from riveted to bolt-and-nut construction. Here's how it happened:

Two Autocar engineers took off on a coast-to-coast run to shake the bugs out of a new test model. Things went well until a riveted spring bracket broke. It took an entire day just to chisel through the rivets because it was hard to get at the bracket.

From that day on, it was *accessible* bolt-and-nut construction exclusively for all Autocar trucks. And Autocar standardized on RB&W bolts. One dividend from using these rugged bolts is that Autocar can specify higher-strength material than is practical for riveting. Furthermore, tests on structures like bridges show that rivets frequently loosen. This doesn't happen to bolts on Autocar frames.

Where you want to join structural members firmly together so they'll *stay* together for good, high-strength bolting is often your best bet.

As the leading manufacturer of all kinds of fasteners, we're in the unusual position of always being able to recommend and supply the right ones for all your needs. Write to RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N. Y.



FASTER FASTENING is achieved in the Autocar plant at Ardmore, Pa., by using air tools like the one shown here to run up RB&W nuts on RB&W bolts on an Autocar truck frame. In addition to making tight, accessible joints, bolting effects substantial assembly savings.

3.1

RB&W

108 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N. Y., CORAOPOLIS, PA., ROCK FALLS, ILL., LOS ANGELES, CALIF. *Additional sales offices at:* PHILADELPHIA, PITTSBURGH, DETROIT, CHICAGO, DALLAS, SAN FRANCISCO. *Sales agents at:* PORTLAND, SEATTLE. *Distributors from coast to coast.*

KENNETH VAN KAMPEN
. . . Warner Electric's gen. supt.

JOHN W. PENNINGTON
. . . heads Koppers new technical dept.

Jr., sales manager, silver brazing alloy division; and **Otto W. Langhans,** works manager.

Kenneth Van Kampen was named general superintendent, **Warner Electric Brake & Clutch Co.,** Beloit, Wis. Formerly magneto division supervisor in the Beloit plant of Fairbanks-Morse Co., Mr. Van Kampen joined Warner in June of this year.

James Bere was appointed a sales engineer for **Clearing Machine Corp.,** Chicago. He will represent the firm in southern Ohio, Kentucky and West Virginia.

John W. Pennington was named manager of the new technical department of the metal products division of **Koppers Co. Inc.,** Pittsburgh. He joined Koppers in 1950 as chief engineer of the division's piston ring department and since 1952 has held the post of executive engineer for the entire metal products division.

Joseph E. Lindsay, formerly research engineer, was advanced to assistant manager, engineering service department, **National Radiator Co.,** Johnstown, Pa. Since joining the firm in 1935 Mr. Lindsay has served principally in its research department, but also acted as chemical engineer and sales engineer in the firm's plastic metals division.

Gordon H. Gillis, formerly superintendent of heat treating at Kropp Forge Ordnance Co., Melvindale, Mich., joined **Carboloy Department,** Detroit, General Electric Co., as a heat treating engineer for coal mining tools in the carbide process and development section.

Dr. John P. Howe and **Dr. Robert L. Loftness,** scientists in the field of nuclear energy, have joined the staff of **North American Aviation Inc.'s** atomic energy research department, Los Angeles. Dr. Howe will be chief, reactor materials section, and Dr. Loftness was made group leader of chemical development.

Oilgear Co. appointed **E. H. Parduhn** district engineering representative in charge of the Pacific Northwest with headquarters in Seattle. He succeeds **R. E. Davis,** recalled to the home office in Milwaukee to undertake special engineering assignments.

Edward Valves Inc., subsidiary, Rockwell Mfg. Co., East Chicago, Ind., appointed **H. W. Bierman** as sales engineer for territory comprising Oklahoma and parts of Missouri, Kansas, Arkansas and Texas. He will have headquarters at Rockwell's offices in Tulsa, Okla.

OBITUARIES . . .

Victor A. Hedberg Jr., 53, sales manager, screw machine products division, **Scovill Mfg. Co.,** Waterbury, Conn., was killed Sept. 16 in the crash of the American Airlines plane in Albany, N. Y.

James Simpson, 55, vice president of **Douglas Aircraft Co.** and general manager of the Douglas Long Beach, Calif., plant, died Sept. 16.

J. Irvin Schultz, vice president-treasurer, **National Broach & Machine Co.,** Detroit, died Sept. 12.

James G. McRea, 55, founder and former president of the **Canadian Metal Mining Association,** died Sept. 12 in Toronto, Ont.

J. Russell Case, 74, chairman of the board of **W. R. Case & Son,** cutlery firm, Bradford, Pa., died Sept. 16. He also was president of Case Shear Corp. and W. R. Case & Sons Ltd. of Canada.

Dr. Colin Fink, 71, electrochemist, metallurgist and consultant on metals, died Sept. 18. He was professor emeritus of chemical engineering at **Columbia University** and head of its division of electrochemistry from 1922 to 1950. Among his many discoveries were chromium plating of metal, a process of electroplating metal with tungsten and of coating steel with aluminum.

Frank C. Reed, 74, retired president of the former Westinghouse Electric Elevator Co., now the elevator division of **Westinghouse Electric Corp.,** died Sept. 18 in Grove City, Pa.

Robert J. Parsons, a retired design engineer of **General Electric Co.,** Schenectady, N. Y., and for a number of years chief engineer for Consolidated Car Heating Co., Albany, N. Y., died Sept. 14.

Leo H. Klein, 61, a department head at the Oxweld plant of **Union Carbide & Carbon Corp.** in Newark, N. J., died Sept. 19.

Harry M. Reed, 53, a director of **Vanadium-Alloys Steel Co.,** Latrobe, Pa., and secretary of both Vanadium-Alloys and its subsidiary, Anchor Drawn Steel Co., died Sept. 5.

William H. Hunton, Buffalo district sales manager for **Aluminum Co. of America,** died Sept. 12.

Bayard D. Kunkle, member of the board of directors and retired vice president of **General Motors Corp.,** Detroit, died Sept. 14. He had retired in 1949.

they "pass the ammunition"

When heat treat specifications get really tough—as in the production of projectiles—'Surface' furnaces and conveyor equipment give you the performance you need. The shells pictured are starting through synchronized 'Surface' hardening and drawing furnaces, at 150 rounds or 4200 pounds per hour. This is typical of the many critical jobs being successfully handled by 'Surface' continuous, automatic hardening and drawing lines. They are designed and built to meet *your* production requirements, whether for watch gears, ordnance or auto parts. With 40 years' experience in heat treating, producing many types and sizes of furnaces, with a variety of work handling systems, Surface Combustion can meet your space and production requirements—meet your toughest specifications economically.

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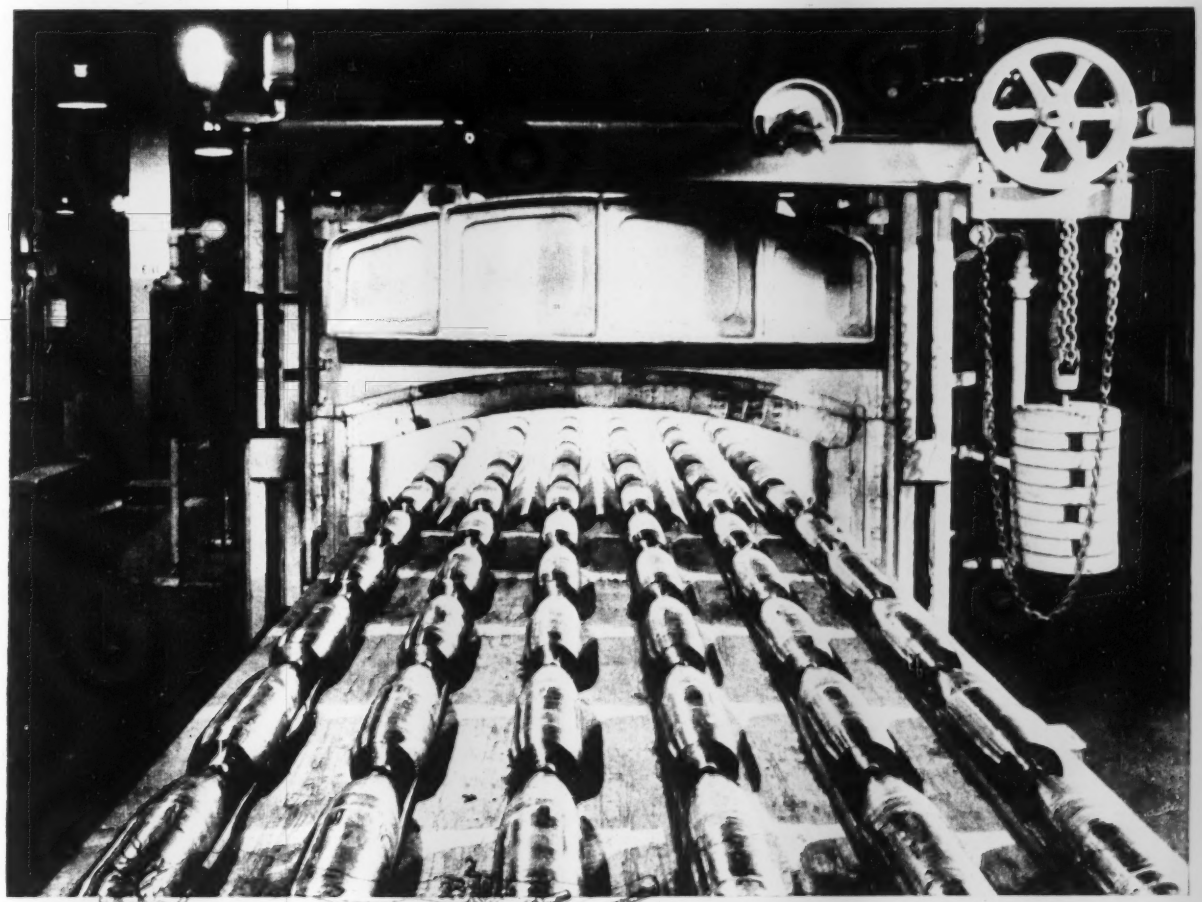

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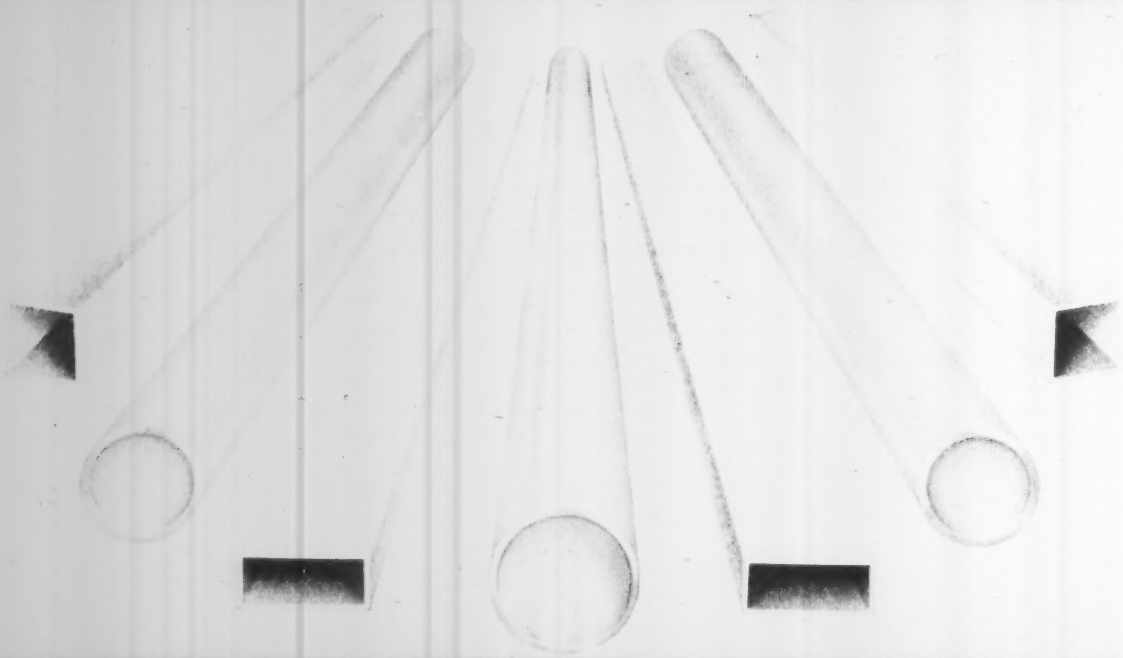

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AMERICA'S MOST MODERN TUBE MILL

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Plans Ilmenite Plant

Output of Du Pont's $3-million plant in Florida will be 100,000 tons a year

A MINE AND PLANT to produce ilmenite, the raw material for titanium metal and pigments, will be constructed for E. I. du Pont de Nemours & Co., Wilmington, Del. The $3-million facility will be built near Lawtey, Fla.

The schedule calls for completing the installation and getting it into operation early in 1955. It will be built and operated for Du Pont by Humphreys Gold Corp., Denver. The latter company also will provide some of the major equipment.

"Traveling Lake"—To be known as the Highland plant, it will be a rather unusual operation and similar to the firm's Trail Ridge plant near Starke, Fla. There, a dredge floating on a "traveling lake" mines Florida's white sands to get out coal-black ilmenite. The "traveling lake" is about half a mile long and 500 ft wide, dug out of the sandy soil. A dredge and separators pick up the sand in front, extract black ore, and pour white sand back into the lake as back fill. Thus, the lake travels forward in the direction of the work—moving in where the sand is removed and being pushed forward by the sand returned in back.

The sand is pulled up by a suction dredge and piped directly to a floating "scrubber" barge. There, the organic coating is removed, and the heavy black mineral is separated from the white sand by a system of spirals in a "wet mill." The concentrated ore is piped to a "dry mill" on land.

In the latter mill, the ilmenite is further concentrated by electromagnetic and electrostatic separators. From there, it is loaded into freight cars and shipped north to Du Pont plants for further processing. Output is about 100,000 tons a year; capacity of the new plant will be the same.

Orban Moves Detroit Office

Kurt Orban Co. Inc., New York, moved its Detroit office and service center to larger quarters at 18627 James Couzens Highway.

Over $75,000 of German machine tools have been installed for demonstration and for training plant personnel on the use of the equipment.

Tube Turns Opens Branch Plant

Tube Turns Inc., Louisville, manufacturer of welding fittings and flanges, established a branch plant at 7120 Katy Highway, Houston. W. B. Whenthoff is the district manager.

Myerstown Acquires New Line

Myerstown Foundry & Machine Works Inc., Myerstown, Pa., acquired the full line of Smith precision inspection tool patterns. They are cast of Momex metal, the semisteel alloy of varying grades to suit different purposes, produced by Myerstown.

Ingalls Gets Big Contract

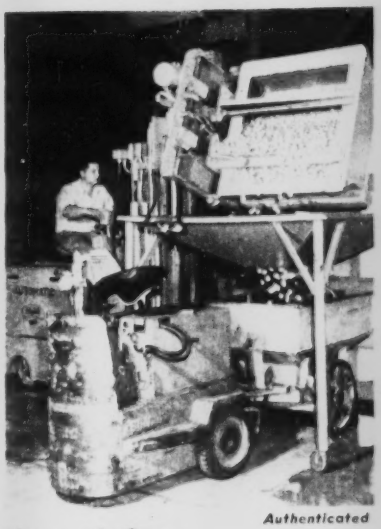
Maritime Administration, Department of Commerce, awarded a contract to Ingalls Shipbuilding Corp., Birmingham, to build two special design steam turbine propelled refrigerated stores ships for the Navy at a cost of $24,880,000. The contract award is exclusive of the costs of government-furnished material and armament. They will be built at the company's Pascagoula, Miss., shipyard and are scheduled to be delivered in 1955.

Powdercraft Appoints Agent

Powdercraft Corp., Spartanburg, S. C., fabricator of sintered powdered metal parts and self-lubricating bearings, appointed H. L. Kinney of Cleveland as its representative in Ohio. He was associated with S. K. Wellman Co. and Wel-Met Co. prior to becoming a manufacturer's representative.

100th Year for Baker-Raulang

Baker-Raulang Co., Cleveland, is observing the 100th anniversary of its founding this year. The firm had its beginning in 1853 when Jacob Rauch opened a blacksmith and wagon-repair shop. In subsequent years, Charles E. J. Lang and Walter C. Baker entered the company and products gradually shifted from horsedrawn vehicles to automobiles and other mechanized equipment. Today, Baker-Raulang makes industrial trucks, tractors, cranes and mining equipment.



Authenticated

Up and Over

Brass cartridge slugs are dumped automatically into carts by an industrial truck roll-over attachment developed by Automatic Transportation Co., Chicago. The clamp, mounted on a revolving carriage, has an extra pair of forks to grasp the container as it is tipped 180 degrees for emptying

Equipment Firm Buys Plant

Recently-formed Wagner Bros. Equipment Co. acquired a plant in Wayne, Mich., where the firm's fully automatic electroplating machine is in production. Another section of the plant is being tooled for the manufacture of semiautomatic platers, package unit platers, agitators and anode containers. The company expects to offer soon a tank lining service featuring a new type of material. John D. Tebben is president.

Bearings Firm Plans Expansion

Norma-Hoffmann Bearings Corp., Stamford, Conn., having substantially completed new building and production-facility expansion involving about $2.7 million, are obtaining estimates for construction of still another building. The company makes precision ball bearings, cylindrical roller bearings and ball thrust bearings, as well as certain

related products such as lubricating greases and cup mountings for bearings.

American Sterilizer Expanding

American Sterilizer Co., Erie Pa., announced that construction of the first unit of a projected 56 acre plant development program is under way. The initial unit, with 95,000 sq ft of floor space, will consist of a foundry, warehouse, metal fabrication department, research and development laboratory and a power plant for heating and testing services.

Costing about $1 million, the first plant unit is scheduled for completion by May, 1954. Other manufacturing and office units will follow, providing 250,000 sq ft of floor space. The development eventually will house all operations of the company in the Erie area.

St. Louis Tool Firm Moves

Novo Engine Co.'s Lehmann Boring Tool Division moved to larger quarters at 4389 Duncan Ave., St. Louis. The new location affords an increase of at least 100 per cent in possible manufacturing capacity, says George B. Greaves, general manager of Lehmann Machine Co., which also is a division of Novo Engine Co.

Nelson Names Hawaiian Agent

Nelson Stud Welding Division, Gregory Industries Inc., Lorain, O., appointed Honolulu Iron Works Co. as a distributor of fasteners and welding equipment in the Hawaiian islands. Stud welding guns, as well as welding machines and portable battery power sources, will be available for purchase or rental through Hilo Iron Works, Hilo, Hawaii, a subsidiary of the Honolulu firm.

Vanton Pump Changes Name

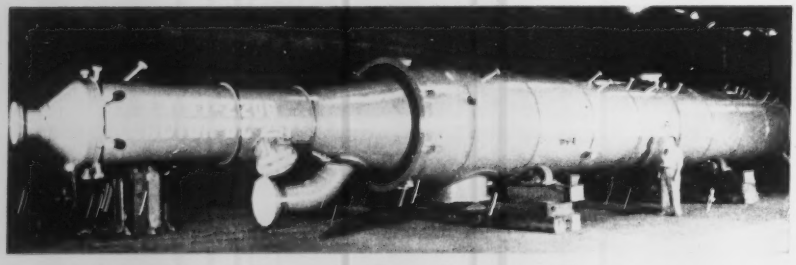
Vanton Pump Corp., New York, changed its corporate name to Vanton Pump & Equipment Corp. The company's plant has been moved from Long Island City, N. Y., to a new building on the premises of its affiliate company, Cooper Alloy Foundry Co., Hillside, N. J. Executive and sales offices will remain at the Empire State building, New York.

Gayer Manages West Coast Unit

Westinghouse Electric Corp., Pittsburgh, is operating its 57-acre Sunnyvale, Calif., plant as a single unit under the managership of George F. Gayer. It is now known as the Pacific Coast Manufacturing Plant. Westinghouse acquired the factory from Joshua Hendy Iron Works in 1947.

Titeflex Inc. Sells Rights

Titeflex Inc., Newark, N. J., sold the design and manufacturing rights of its industrial filter for the electroplating market to Wagner Bros. Inc., Detroit, distributor of filtration and automatic equipment to the electroplating industry. Titeflex retains the design and manufacturing rights of its filters for the chemical and other industries. Titeflex also manufactures metal hose and produces a wide range of aviation components.



Bethlehem Steel Ships 24-Ton Reactor Tower

A reactor tower, important member of the intricate equipment used in the distillation and separation of crude oil into its constituents, is shown above. It is ready for shipment from the Bethlehem, Pa., plant of Bethlehem Steel Co. Made of welded steel plates, it weighs 24 tons and is about 77 ft long. Inside diameter ranges from 7.5 ft at the large end to about 4 ft at the small end

Koehring To Buy Waterous

Milwaukee firm will have plant in Canada for manufacture of construction equipment

KOEHRING CO., Milwaukee, is conducting final negotiations for purchase of Waterous Co. Ltd., Brantford, Ont. The subsidiary will be known as Waterous Koehring Co. Ltd. with E. O. Martinson as general manager.

Expansion of industry in Canada, particularly in the oil, lumber, mining and construction fields, created a need for thousands of units of construction equipment, says Julien R. Steelman, president of Koehring. Because his company needed Canadian manufacturing facilities to obtain the most favorable price and delivery positions, Koehring made its offer to purchase Waterous in Ontario.

Construction Equipment — The latter firm specializes in production of grinders and chippers for pulp paper mills, general sawmill machinery, industrial heating boilers, road rollers, asphalt hot-mix plants, and related items. Plant facilities include a gray iron foundry, a welding shop and a number of machine shops.

Koehring Co. manufactures power shovels, cranes, pavers, finishers and other construction equipment. It controls a number of subsidiaries manufacturing allied equipment.

Racine Chosen as Headquarters

Home offices of Massey-Harris-Ferguson Co. will be in Racine, Wis. H. H. Bloom, president of the firm's United States Division, took part in the negotiations in England which completed the merger of Massey-Harris Co. and Harry Ferguson Co. Ltd. The firm makes farm machinery.

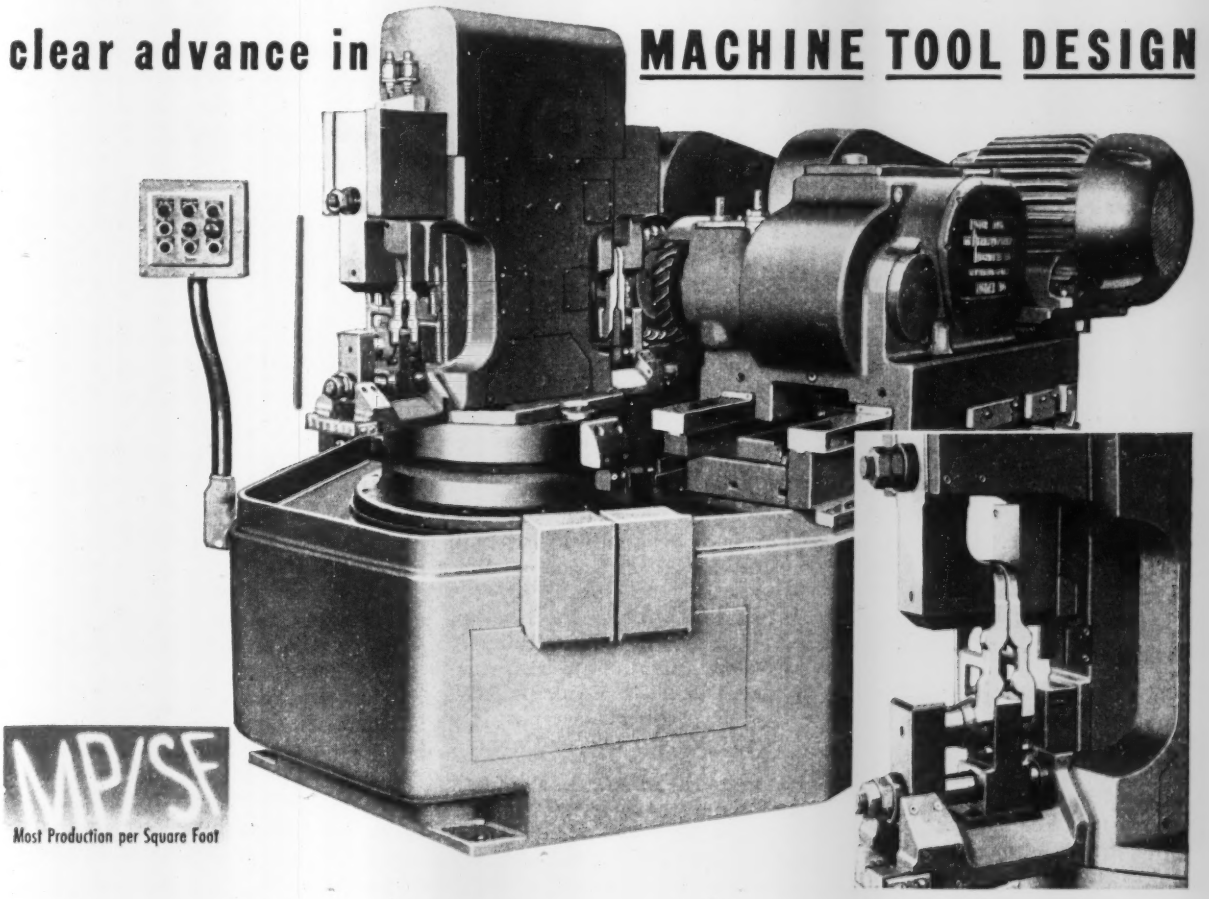
Clark Celebrates 50th Year

Clark Equipment Co., Buchanan, Mich., manufacturer of industrial materials handling trucks and automotive components used in the production of trucks, busses, farm tractors and construction equipment, is observing its 50th year of operations. The Clark pay-

Every time—count upon

MOTCH & MERRYWEATHER Engineering for a

clear advance in MACHINE TOOL DESIGN



MP/SF
Most Production per Square Foot

Each machine tool built by us is charged with doing a specific job better than before and for less. To us that is a privilege — a challenge — an obligation. Every machine developed by the Motch & Merryweather engineering staff must earn a permanent place for itself in Industry — must contribute permanently to a nation's advance in point of efficiency and economy — must mark a visible step forward in machine tool design and construction . . . An example is outlined on this page.

This M & M duplex production single-purpose milling machine mills two tractor side bars while two others are being loaded (removing at same station). Actually mills 70% of the time; up to 268 side bars per hour @ 100%. Two heads move, not the operator. Rigidity and power (30 h.p.) hike output. Fixtures to suit.

Manufactured by — THE MOTCH & MERRYWEATHER MACHINERY CO. —
CLEVELAND 13, OHIO
Builders of Circular Sawing Equipment, Production Milling, Turning and Special Machines

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT

roll has grown from less than 20 persons 50 years ago to more than 7000 today. Plant facilities, aggregating about 2 million sq ft of floor space, are located in Buchanan, Battle Creek, Jackson and Benton Harbor, Mich.

Canadian Firm Boosts Output

Canadian government's munitions producing company, Canadian Arsenals Ltd., expects to step up production to $7 million a month in the coming year, according to Defense Production Minister Howe. At the same time, he reported that for the 1952-53 fiscal year production of the firm was increased to the value of $5 million a month from $1 million.

Curtiss-Wright Expanding

Curtiss-Wright Corp.'s Metals Processing Division is constructing a $600 000 administration building in Buffalo. It is part of the $10-million Curtiss-Wright expansion in the city. Already under construction is a building to house a propeller-making hydraulic press.

Barstow Moves Office

W. G. Barstow Co. is celebrating the eighth anniversary of its founding by moving into larger quarters at 6105 Excelsior Blvd., Minneapolis. The company represents in a sales and engineering capacity a number of manufacturers of equipment and components, some of which have to do with the application of heat and special atmospheres to industrial processes.

Tool Firm Opens English Plant

Armstrong Whitworth & Co. Ltd., a subsidiary of Thor Power Tool Co., Aurora, Ill., is producing pneumatic tools in its new plant at Tynemouth, England. The factory has 50 per cent more manufacturing space than the former plant. Purchased by Thor in 1951, the English company has increased its production and orders 75 per cent, mainly through the introduction of American designed tools to the Armstrong Whitworth line and improving manufacturing methods. R. J. Faverty, former Chicago and Detroit branch manager for Thor, is managing director of the English company.

Houston To Get Battery Plant

Gould-National Batteries Inc., Trenton, N. J., is constructing an automotive storage battery plant in Houston. The $750 000 plant will have a capacity of 2000 batteries a day, says Albert H. Daggett, president.

100th Year for Beams

COOPER UNION celebrated the 100th anniversary of the laying of the cornerstone of its Foundation building at Fourth avenue and Eighth street, New York, on Sept. 17. This is the oldest building in the United States supported by rolled structural beams.

Highlight of the ceremonies was the unveiling of a stainless steel commemorative plaque, presented to the school by American Institute of Steel Construction Inc. Presentation of the tablet was made by John E. Jackson, president of AISC. Irving S. Olds, chairman of the trustees, and Dr. Edwin S. Burdell, president, accepted the gift for the Cooper Union.

Autocar Building Plant

White Motor Co., Cleveland, is constructing manufacturing facilities in Exton, Pa., for its recently-acquired Autocar Division. The plant will replace Autocar's plant at Ardmore, Pa., and will represent an investment of more than $2 million. E. F. Coogan is vice president in charge of the division. C. R. C. Custer continues as treasurer of Autocar; B. B. Bachman, head of engineering and development; A. Gelpke, in charge of production.

Morrison Buys Equipment Firm

International Equipment Co., Buffalo, manufacturer of automobile specialties, was acquired by Morrison Railway Supply Corp., that city, and will be operated as a division of Morrison. Marcy L. Morrison will manage the new division. International Equipment Co. makes tire balancers, machines for putting a nonskid surface on tire treads, detachable snow plows and other items.

Metal Fabricator Buys Plant

Universal Metal Fabricators Inc., Saginaw, Mich., manufacturer of electric milk coolers, milk house wash tanks, cold storage units and other fabricated sheet metal products, purchased a plant to replace the one that was leveled by fire last July. With the new building, providing more than double the manufacturing space lost in the fire, Universal acquires a contract to build and assemble warm air heating units for Jackson & Church Co., previous owner of the building. Universal Metal Fabricators Inc. plans a substantial increase in production of a wide range of sheet metal products.

College To Operate Reactor

North Carolina State College, Raleigh, of the University of North Carolina, and Atomic Energy Commission, Washington, signed an agreement which opens the way for immediate operation of the first university-owned nuclear reactor in the nation. Through the contract, AEC will lend the college enough fissionable uranium 235 to fuel its research reactor, recently constructed in a building on the campus.

Simmons Machine Gets Agency

Simmons Machine Tool Corp., Albany, N. Y., manufacturer of heavy machinery and machine tools, has become the exclusive export sales agency for the Ace-Central States Machine Tool Co., Detroit. The latter company designs, builds and installs complete manufacturing units, including automatic and automation equipment, large jigs, fixtures and supporting tools. It offers a complete design-to-finished-product service, which is used by automotive manufacturers and other mass-production companies in the metalworking and electrical fields.

The Export Division of Simmons

(*Please Turn to Page* 79)

GREEN LIGHT

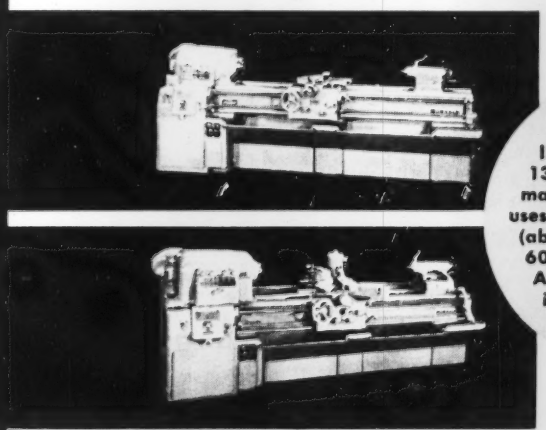
FOR DEAD-CERTAIN TURNING

Figure the job, maybe, to plus or minus .001". Set it up to a gnat's eyebrow. Work out speeds and feeds to the optimum. And what's it all worth—quality- and cost-wise—if bedway wear has begun to warp the lathe's intrinsic trueness?

So it's an absolute "must", for good operation, to have carriage and tailstock bedways that stand up for the life of the lathe. Like Monarch flame-hardened ways. With Monarch lathes, you get bed castings of strong, dense, wear-resistant nickel-alloy cast iron. You get them flame-hardened to a depth of ⅛" plus, to a Scleroscope reading of 70 to 72 Shore—followed by grinding to .0005" (overall). And *that* gives you a lathe with bedways as hard as hardened steel—but with Martensic structure blended into the tough, fine Pearlitic iron underbody with its retained graphitic carbon. Integration plus! Hardness plus! Lubricant-retention plus!

Our method is more demanding, more expensive. But it gives *you* no worries about uneven wear of loosened steel strips—about different coefficients of expansion—about bed rigidity lost by cutting and drilling for inserts—about abrasion. And it gives *us* unsolicited reports like this: "No appreciable bed wear after over a million cycles!"

The Series 60 Lathes shown here, like *all* Monarch lathes, have Monarch flame-hardened and ground bedways. And more—much more! Write, please . . . *The Monarch Machine Tool Company, Sidney, Ohio.*



Monarch's most universal lathe. Available in 13", 16" & 20" swings, many lengths, for many uses. 13" Toolmaker's Lathe (above). Below, 16" Series 60 Engine Lathe with Air-Gage Tracer. For information, request Booklet #1113.

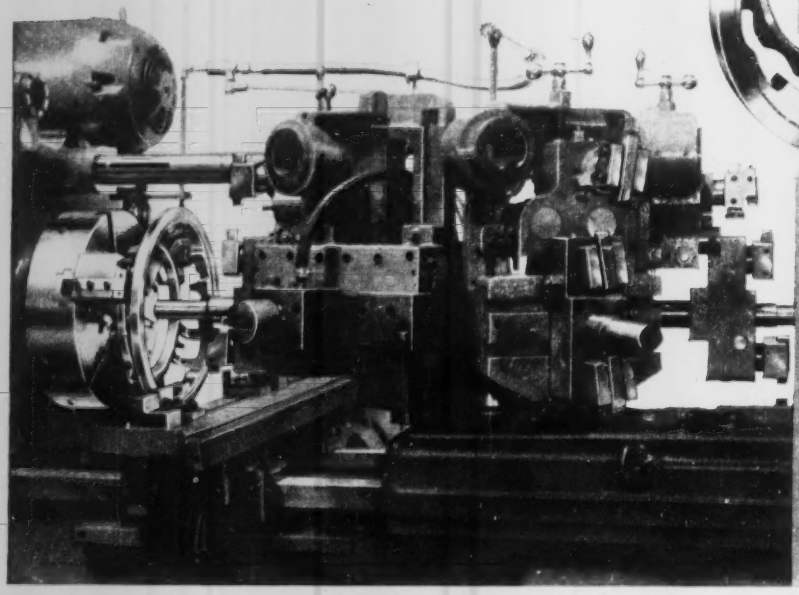
Monarch

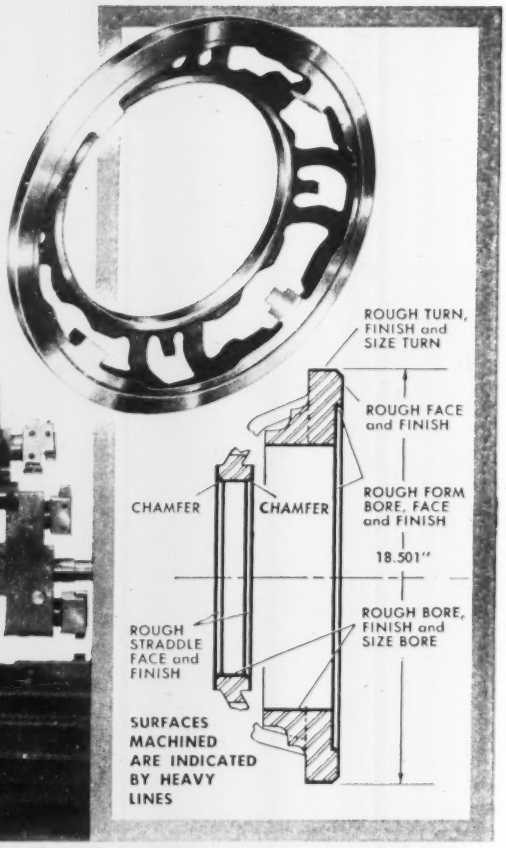
ACCURACY • ECONOMY • LONG LIFE

TURNING MACHINES

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

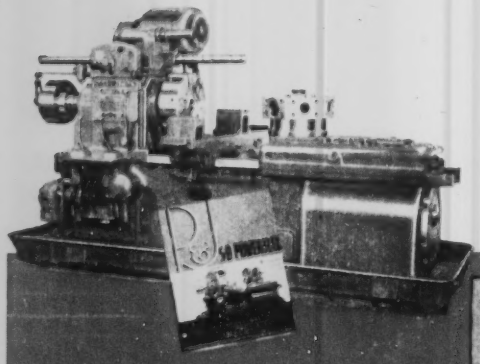
DO IT BETTER, DO IT *AUTOMATICALLY*




ROUGH TURN, FINISH and SIZE TURN
ROUGH FACE and FINISH
CHAMFER
CHAMFER
ROUGH FORM BORE, FACE and FINISH
18.501"
ROUGH BORE, FINISH and SIZE BORE
ROUGH STRADDLE FACE and FINISH
SURFACES MACHINED ARE INDICATED BY HEAVY LINES

. . . do it on a 5-DELX POWER-FLEX Automatic Turret Lathe with P&J Tooling

For example, the steel casting shown above required *twenty* separate machining operations all of which were accurately performed in a single, fully-automatic cycle . . . thanks to P&J Tooling on a P&J 5-DELX Power-Flex. Set for most effective speeds and feeds for each cut, P&J Automatics faithfully repeat the same cycle for every work piece without the chance of operator error. Operator fatigue is greatly reduced; one man can easily tend several machines allowing maximum opportunities for divided labor costs.



You can take guesswork out of your production picture . . . be sure of better work, lower costs and fewer rejects . . . when you do it automatically. Let today's outstanding production team — P&J Automatics plus P&J Tooling go to work for you. Send today for your copy of the 5-DELX Power-Flex Bulletin No. 131 — or ask P&J Tool Engineers to submit time and money-saving recommendations based on your own prints or sample parts.

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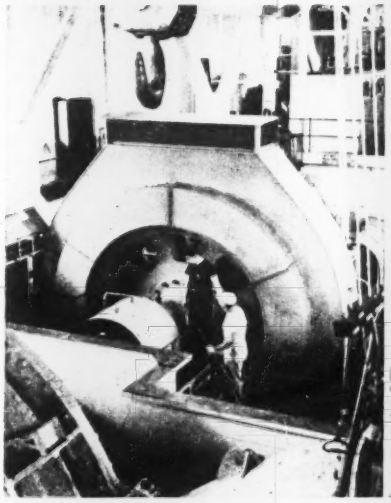
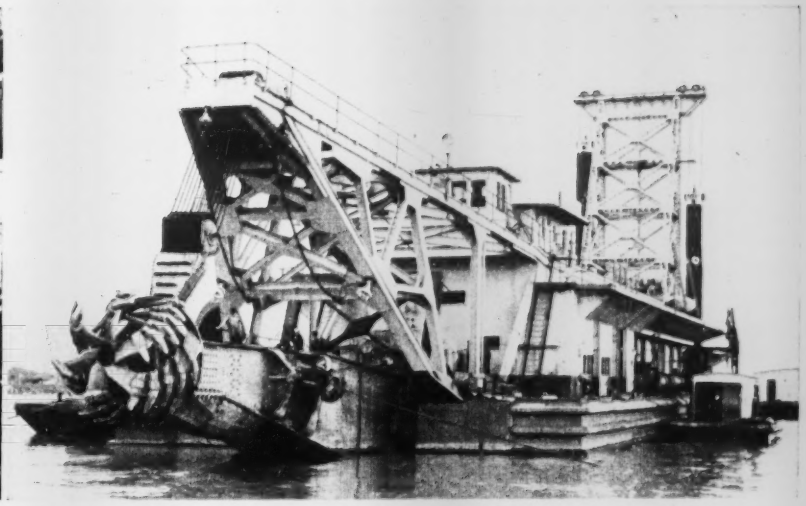




General Electric Equipment Powers Huge Pipeline Dredge

Hydro-Quebec, the huge pipeline dredge shown above at right, is being used to clear the 3300-ft width of the 15-mile-long Beauharnois Canal in Quebec to a depth of 35-ft. An estimated $500,000 worth of General Electric apparatus is used on the 280-ft vessel that displaces 2500 long tons. The 18-ft diameter wound-rotor induction motor shown above at left drives a centrifugal pump capable of sucking up and discharging 28-in. boulders weighing up to 1500 lb. The 8000-hp motor receives its power supply from the utility via a 4000-ft submarine cable laid on the bottom of the canal

(*Continued from Page* 76)

Machine Tool Corp., 50 E. 42nd St., New York, will handle Ace-Central States' export sales and engineering service. Ace-Central States combines the engineering and mechanical staffs and facilities of two well known Detroit concerns: Central States Engineering Corp., design engineering organization in mass production equipment; and Ace Tool & Die Co., a builder of special machines, supporting tooling, jigs, gages and fixtures.

Diversey Buys Selcon Firm

Diversey Corp., Chicago, bought Selcon Engineering & Chemical Co., Chippewa Falls, Wis., manufacturer of automatic solution controls and sanitation chemicals. Diversey is a producer of industrial chemicals and compounds.

American Welding Expands Plant

With construction completed on the last of three additional plants, part of a $5-million expansion program and installation of machine tools and other equipment progressing rapidly, prospects are bright for an early increase in production of jet engine components at the Warren, O., property of American Welding & Mfg. Co. This program had its inception in January, 1952, when Warren Machine & Die Co., specialists in tools and fixtures, became a division of American Welding.

Ideal Marks 50th Year

Ideal Electric & Mfg. Co., Mansfield, O., is celebrating the 50th year of its founding. Company started operations with a line of small dc motors and generators for industrial applications and for electroplating service. Today, the firm produces a complete line of electrical machinery, switch gear and controls for "a well diversified line of industrial apparatus from 1 to 10,000 hp," says S. Glen Vinson, president.

Carrier Plans Big Expansion

Carrier Corp., Syracuse, N. Y., soon will launch a $10-million expansion program, says Cloud Wampler, president. The program includes extensive additions to the Syracuse facilities and erection of a plant in the South. The Syracuse construction will provide additional office, laboratory, warehouse and storage space.

The proposed southern plant will be devoted to production of unitary products, such as room air conditioners, year-around residential air conditioning equipment and self-contained units for use mainly in small commercial establishements.

K-S-M Products Opens Branches

K-S-M Products Inc., Merchantville, N. J., manufacturer of arc welded studs and stud welding equipment, opened sales engineering offices in the Commonwealth building, Denver, in charge of S. G. Kern; and at 785 Market St., San Francisco, in charge of Robert F. Chapman.

Michigan Tool Names Agents

Shear-Speed Chemical Products Division, Michigan Tool Co., Detroit, appointed as its representatives: R. W. Glahn, Syracuse, N. Y.; L. D. Supply Co., Tulsa, Okla., and Wichita, Kans.; E. J. Maddock, Pittsburgh; T. S. Mellen, South Bend, Ind.; Pierce & Rodman, Cleveland. The division is introducing a new universal coolant-lubricant for industry.

Agents Adopt Rapistan Name

Distributors of products made by Rapids-Standard Co. Inc., Grand Rapids, Mich., are being incorporated under the trade name Rapistan. The distributor in Chatham, N. J., is operating as Rapistan of New Jersey Inc. Rapids Equipment Co. changed to Rapistan of Cleveland Inc., Cleveland; Rapids Handling Equipment Co. Inc., to Rapistan of Buffalo Inc., Buffalo;

Rapids Handling Equipment Co. Inc., to Rapistan of Michigan Inc., Grand Rapids, Mich.; Rapids Handling Equipment Co. of Philadelphia Inc. will change to the Rapistan name later this year. Products include gravity and power conveying equipment, industrial casters and hand trucks and related materials handling equipment.

Carlon Opens Oregon Plant

Carlon Products Corp., Cleveland, established facilities for the manufacture of plastic pipe and fittings in Klamath Falls, Oreg. Floyd Wilson is manager of the new Carlson Division.

Detroit Firm Buys Louden

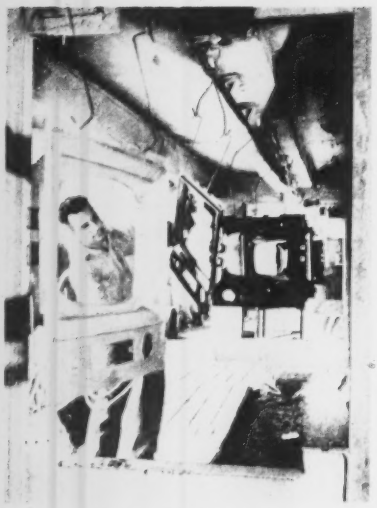
Mechanical Handling Systems Inc., Detroit, manufacturer of trailers for the transportation of automobiles, automatic handling equipment and conveyor systems for mass-producing industries, purchased Louden Machinery Co., Fairfield, Iowa. Purchase price was in excess of $2 million. Principal products of the Louden firm are overhead track and crane systems, dairy barn and other agricultural equipment. Officers of Louden are W. V. Casgrain, president; W. L. Fry, executive vice president and general manager; R. W. Louden, vice president; A. E. Labagh, treasurer; J. G. Barwise, secretary.

Universal Welder Corp. Moves

Universal Welder Corp., manufacturer of spot, butt, seam and projection welders, moved to new quarters at 2557 E. 79th St., Cleveland. The street number was erroneous as published in the Sept. 7 issue of STEEL. The new facility has advantages of a crane and monorail hoist equipment, ground floor manufacturing space with loading docks and adequate office and parking facilities.

Allis-Chalmers Names Agents

Allis-Chalmers Mfg. Co., Milwaukee, appointed Halsmith Co., Decatur, Ga., as distributor for its motors, control and drive equipment in that territory; Machinery Sales Corp., New Bedford, Mass., as distributor for its motors and controls; and Industrial Electric & Supply Inc., Rapid City, S. Dak., as distributor for its motors, controls and transformers.



Holds the Finish

Front panel of a steel television cabinet is spray painted after an application of Fosbond coating, manufactured by Pennsylvania Salt Mfg. Co., Philadelphia. The coating provides stronger adherence of the painted finish

Ontario Steel To Expand

Directors of Ontario Steel Products Co. approved plans for two plants at Milton, Ont., on a site purchased some months ago. One plant will be used for manufacture of chassis springs while the second will be used for electroplating.

New Ceramic Coatings Offered

General Ceramics & Steatite Corp., Keasbey, N. J., established a ceramic coating department. These coatings will be produced by the Chemical Equipment Division in the company's Keasbey plant. Plans have been made to produce specialized coatings for retarding metal oxidation, reflecting radiant energy in addition to radiation suppressing and high temperature insulating ceramic coatings.

While the current working program now comprises high alloys, General Ceramics coating specialists are giving emphasis to the application of specialized coatings of low carbon steel and low alloys, such as air hardening steels, NAX, chromium - molybdenum bearing types and similar metals. In addition to these steel and alloy coatings, chemically-resistant coatings on steel and enamels of high flexibility and high friability on steel and aluminum also are available.

Nox-Rust To Boost Production

Nox-Rust Chemical Corp. is completely installed in its new plant at 47th street and Central avenue, Chicago. New manufacturing facilities will enable the company to increase production by about 100 per cent. Executive and sales offices were moved to 333 N. Michigan Ave., that city. The company makes petroleum chemicals and rust preventive products.

Service Company Organized

U. S. Fire Protection Engineering Service Inc. was organized by a group of fire prevention and fire protection engineers to assist management in achieving and maintaining a fire-safe and economically-insurable operation. The company has its headquarters at 805 Baltimore Ave., Kansas City, Mo., and has facilities to handle work throughout the country. It has no connection with any insurance company, equipment manufacturer or construction contractor, says Frank. H. Gage, president.

Offers English Instruments

Mine Safety Appliances Co., Pittsburgh, was named exclusive distributor in the United States for a line of dust-measuring instruments manufactured by C. F. Casella & Co. Ltd., London, England.

"Access Area" Cuts Costs

Maintenance costs are expected to be greatly reduced by a unique "access area" under the new $4.5-million Arrow Park plant of Parker Pen Co., Janesville, Wis. Located under the main manufacturing plant, the area consists of four-foot-high spaces in which all utilities are located. All utility lines hang exposed from the ceiling of this area, permitting maintenance crews easy access to them at all times and eliminating the necessity of extricating lines from concrete walls or ceilings.

It's time to think of

You'll find the data you want in this book . . . send for your copy TODAY! Features of this book show how JALTEN can help you build better products:

- **Chemical Properties of Jalten**
- **Mechanical Properties of Jalten**
- **Jalten Equivalents**
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*J&L's new JALTEN series replaces the famous Otiscoloy Line and may be selected in the following combinations of advantages:

Jalten No. 1—High strength, good formability and fabricating, good low temperature.

Jalten No. 2—High strength, impact resistance, moderate forming—improved resistance to atmospheric corrosion.

Jalten No. 3—High strength, moderate forming—improved resistance to abrasion.

J&L STEEL

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Please send me a copy of "Jalten . . . the low alloy high strength steel."

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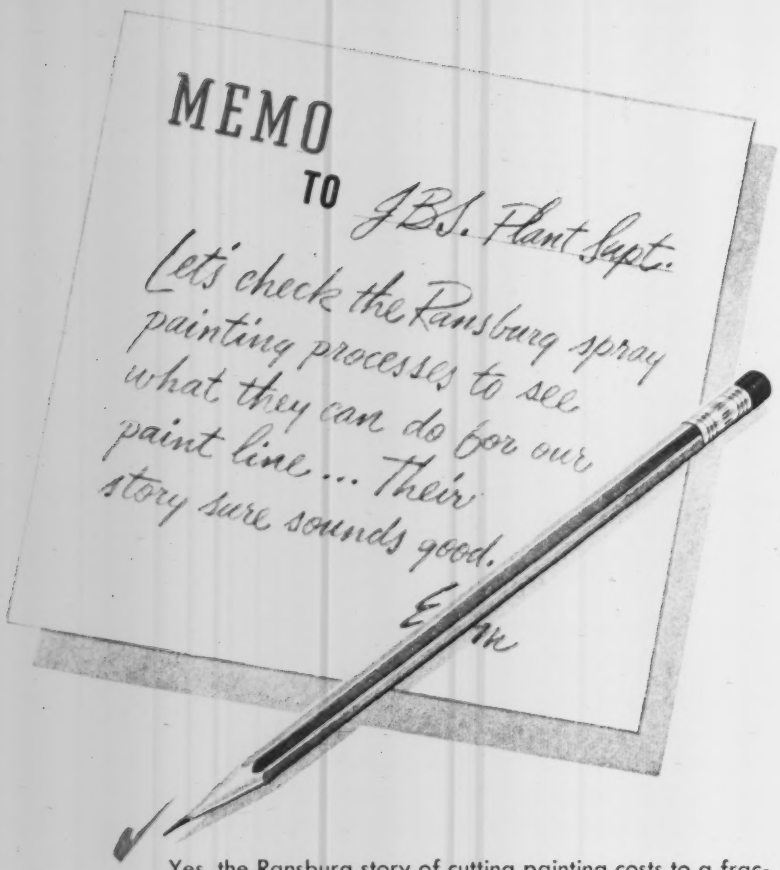
MEMO
TO J.B.S. Plant Supt.
Let's check the Ransburg spray painting processes to see what they can do for our paint line... Their story sure sounds good.
E. M.

Yes, the Ransburg story of cutting painting costs to a fraction of the cost of other methods does sound good. It *is* good!

On most factory production lines, the Ransburg electro-coating processes will provide 2 to 4 times more parts per gallon of paint—automatically—with one operator doing the work of many.

That's because the Ransburg No. 2 Process is the most efficient spray coating process ever developed for industry's use.

If you are a manufacturer of painted products, and if your work volume warrants conveyorized painting, we'd like to tell you more about the production efficiency of the RANSBURG No. 2 PROCESS as it applies to YOUR production. Too, we'd like to show you typical examples of customers' production lines where the Ransburg No. 2 Process is setting new quality standards . . . increasing production . . . and at the same time, saving manpower, money and materials.

Write for literature, or send for "Miracles In Painting" —our new 16mm. sound and color movie which shows on-the-job examples of Ransburg Processes at work in industrial plants all over the nation.

RANSBURG

Ransburg ELECTRO-COATING CORP.

INDIANAPOLIS 7, INDIANA

New Firm Organized

Ramo-Wooldridge plans to have electronics manufacturing facilities in Los Angeles

RAMO-WOOLDRIDGE CORP. has been organized to conduct research, development and manufacturing in the general field of advanced electronics and guided missiles. The company plans to acquire laboratory and manufacturing facilities in the Los Angeles area.

Officers of the new corporation are Dean E. Wooldridge, president, and Simon Ramo, vice president and executive director.

Sponsored by Thompson — Thompson Products Inc. will have a stock interest in the new corporation, says J. D. Wright, Thompson president. This company will be provided with consulting services, possibly leading to production programs for the Cleveland parts concern. Thompson Products first entered the electronics field in 1950 and has pioneered in the development of high-frequency electronic components with wide application to radar, television and long-distance telephone equipment.

Ramo-Wooldridge will specialize basically in advanced system developments involving the general field of guided missiles, radar, computers, electronic controls and automatic intelligence devices.

Carboloy Appoints Agent

Carboloy Department, General Electric Co., Detroit, appointed Henry Walke Co., Norfolk, Va., and Charlotte, W. Va., as a distributor of its standard cemented carbide tools and blanks, carbide-tipped masonry drills and diamond wheel dressers.

Pettibone Buys Wood Mfg. Co.

Pettibone Mulliken Corp., Chicago, acquired assets of Wood Mfg. Co., North Hollywood, Calif., and will operate it as a wholly-owned subsidiary. Wood Mfg. makes roadmixers for asphalt and soil-cement stabilization work and equipment used in preparation of asphalt roads for rehabilitation.

TOUGH FOUNDRY PROBLEMS solved in a hurry!

Hundreds of foundrymen have come to rely on the Republic Pig Iron Metallurgist for quick, accurate answers to tough foundry problems.

His background, gained from years of actual foundry experience plus a thorough knowledge of all types of pig iron and their characteristics, qualifies him to help solve problems that may occur in your foundry.

The Republic Pig Iron Metallurgist is on call at any hour of the day or night for advice and help. Why not make use of his services? There's no cost or obligation.

Let us know when you would like him to call

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GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Republic PIG IRON

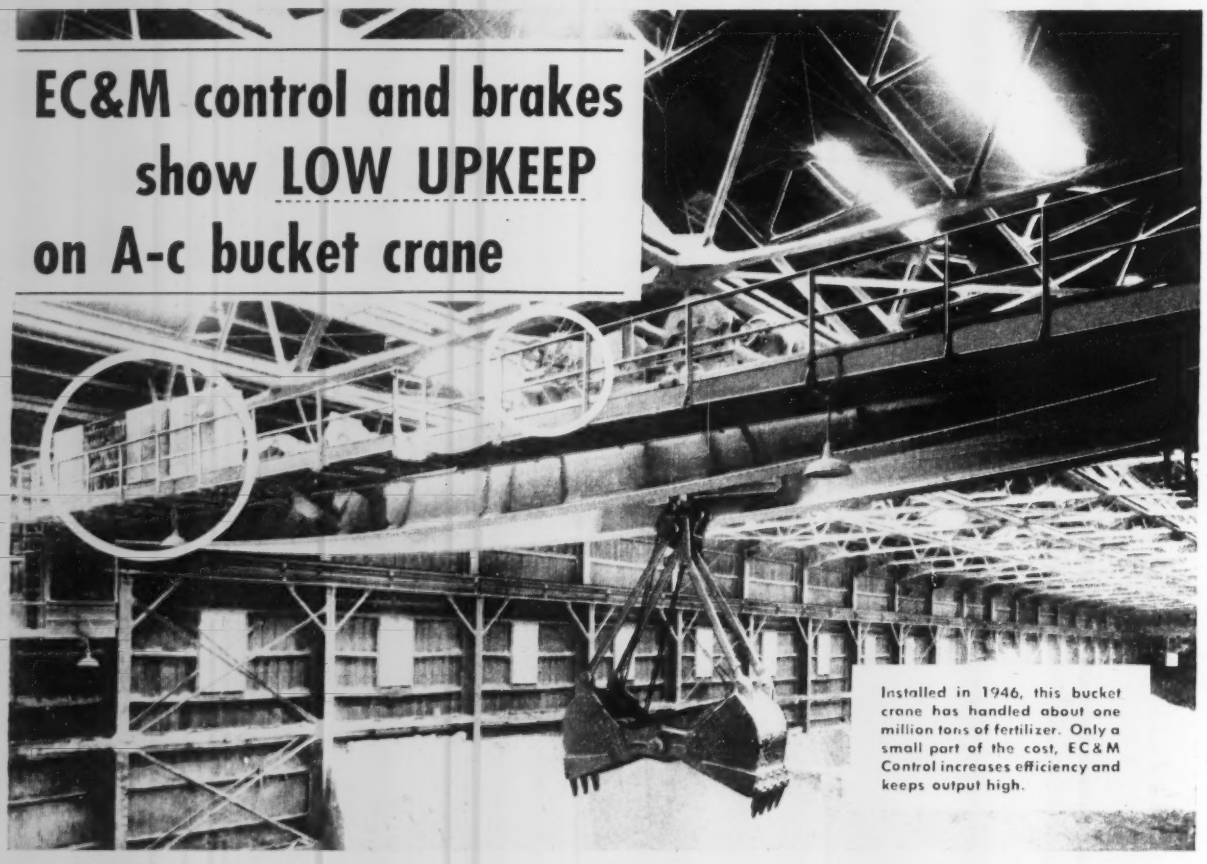
"CHATEAUGAY" Low-Phosphorus, Copper-Free

"REPUBLIC" (Northern) Foundry, Basic and Malleable

"PIONEER" (Southern) Foundry and Basic

REPUBLIC STEEL

EC&M control and brakes show LOW UPKEEP on A-c bucket crane



Installed in 1946, this bucket crane has handled about one million tons of fertilizer. Only a small part of the cost, EC&M Control increases efficiency and keeps output high.

RENEWAL PART Cost only $1.40 per 1,000 tons of fertilizer handled during 7 years of operation.

Sounds good and is good but read the complete story of how EC&M Control Apparatus has given almost perfect service . . . operating 12 hours a day throughout nearly 7 years on this A-c bucket crane in an eastern fertilizer plant. EC&M Controllers and Type WB Brakes have required few replacement parts. Maintenance has been on a routine basis during normal idle periods. EC&M Type WB Brakes and EC&M Frequency Relay Control have operated with *no production delay in 7 years*.

This is typical of the performance of EC&M Control Apparatus on every type of material-handling crane. Cab-operated or floor-operated; a-c or d-c motored. Before buying cranes, contact our nearby office for recommendation on control that will promote high-speed production at low upkeep. It pays to specify EC&M Control for cranes.

NEVER HAD IT SO GOOD!

EC&M LINE-ARC Contactors are known for low upkeep

1. No destructive arc shield burning in 7 years only 3 broken shields replaced.
2. 14 contactor coils have operated continuously with only one replacement.
3. Contacts renewed on an average of once a year on one size and once every two to three years on the other size. No replacements on largest size contactor.

EC&M WB Brakes solve the A-c Brake Problem*

1. Brakes relined on an average of every 18 months.
2. Not a single brake-coil failure.

*Fast-releasing—fast-setting—no chatter, hum or hammer.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

STEEL

September 28, 1953

Technical Outlook

TINY TEMPERATURE TAKER—Device no larger than an aspirin tablet, capable of spotting temperature changes as minute as five ten-thousandths of one degree was shown at the Instrument Show in Chicago. Developed by Carboloy Department of GE, these Thermistors are so sensitive that a puff of breath causes current to flow in their electrical circuits. Principal uses: Industrial ovens, aircraft refrigeration systems or anywhere precise temperature control is a necessity.

CHARGED PAINT PARTICLES— Different approach to the process of ionizing paint spray particles for more even, economical coating of parts has been taken by Scientific Electric, Garfield, N. J. Instead of using external electrically charged screens to ionize paint, new process charges the paint within the spray apparatus itself. Installation and operation is simplified to the point where no skilled labor is required in operation of the apparatus. Equipment is manufactured for outright sale to users.

GOING FORWARD—Gas plating is looking at some tough jobs. In continuous casting of steel, a metal plate can be automatically deposited as the ingot takes shape. Subsequent rolling operation gives clad sheets. In field of castings, ways are available for utilizing cheap castings by insulating surface from corrosion and abrasion by gas-plated metals. Pioneering these developments is Commonwealth Engineering Corp., Dayton, O., which holds basic patents in gaseous carbonyl plating.

WATER SOLUBLE RESIN—Costly, toxic or flammable solvents have no part in preparation and use of a new phenolic resin produced by Reichhold Chemicals Inc., Detroit. Ordinary tap water thins the three-component resin which can then be applied to metallic surfaces as a clear finish or colored enamel. Coatings are then cured at 300° F for 15 to 30 minutes. Major applications are expected to be in the automotive, farm machinery, and appliance fields. Spray gun which applies the liquid and cures it in one operation is in the development stage.

DIECASTING TIP—Keep your eye on a vacuum diecasting process being developed by Nelmor Mfg. Corp., Cleveland. With the elimination of microscopic pockets of air in diecastings, it's possible that many more functional parts will be cast.

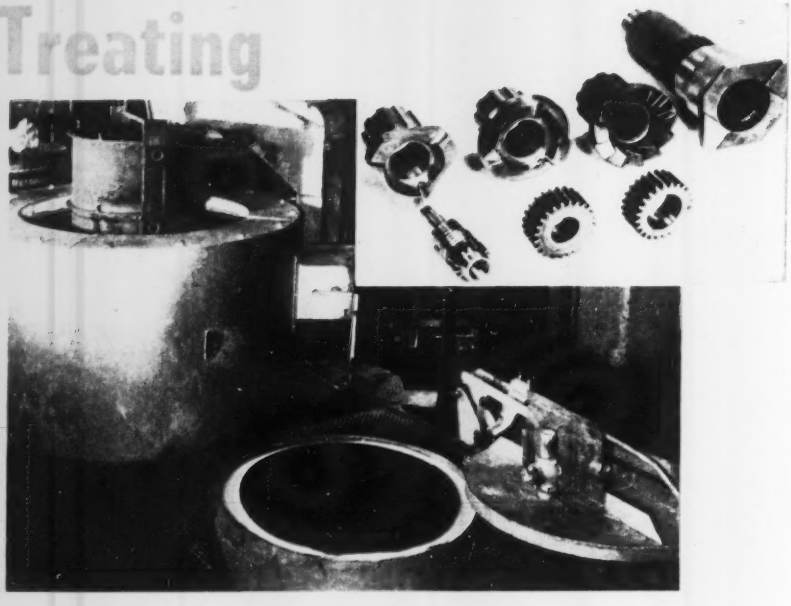
DUCTILE IRON BARS—Problem of center line shrinkage in ductile iron, long a handicap in development of bar stock, was overcome recently by Howard Foundry Co., Chicago. They are producing bars that are sound from end to end and will pass x-ray inspection for density. Bars can be used in maintenance production or specialty work in such applications as pins, bushings, shafts, bearings, seals, valve guides and many others. Bars come in 12-inch lengths in rounds of 1¼, 1¾, 2¼, 2¾, 3⅜, 4⅜ and 6 inches.

WHAT'S ON THE INSIDE—If you're heat treating many different parts in job lots, batch-type furnaces can smooth out the production difficulties. They've done it for Jack & Heintz. See p. 86 . . . 430 stainless steel is going to have to continue carrying the civilian load in our nickel-short economy. Actually, it's a pretty reliable performer in outdoor applications, says the story on p. 88 . . . Gears were being cut faster than they could be deburred so Yale & Towne stepped up the process with brushes, p. 120 . . . Last installment of carbon bar selection story has three full pages of never-before published application tables, starting on p. 106 . . . There's also a clever rotary coil pickling machine described on p. 92.

Metalworking Outlook—p. 37 Market Outlook—p. 127

Batch Heat Treating Is Versatile

Job-lot, heat treatment of different small parts and changing designs demand product and process flexibility. Company turns out about 800,000 pounds of steel parts a month



Pit-type, controlled-atmosphere, carburizing furnace and accompanying cooling pit. Aircraft gears are typical products of the unit

By FRANK CRAHEN
Metallurgical Engineer
Jack & Heintz, Inc.
Cleveland

PRODUCT and process flexibility demanded by job-lot heat treatment of a variety of small parts and continually changing designs can be realized by use of versatile, batch-type furnaces.

To meet such a production schedule, Jack & Heintz Inc., Cleveland, has about 800,000 pounds of steel parts passing through its batch-type, gas-fired heat-treat and electric salt-bath furnaces each month.

About a dozen basic types of heat-treat equipment figure into the processing of a wide variety of aircraft, automotive and other precision parts. The B-47 Stratojet bomber alone uses 28 separate pieces of Rotomotive equipment.

Processes include carburizing, hardening, drawing, annealing and some normalizing. In most cases, changeovers involve no equipment changes and only minor work handling modifications.

Gas Carburizing—Bulk of case carburizing is carried out in a Surface Combustion, pit-type, Atmotrol muffle furnace, with accompanying controlled heating pot. Both units use an endothermic-prepared, RX atmospheric gas, which is manifolded from two centrally-located MRX generators.

Precision aircraft gears made from SAE 4620, 4615, 4820, 1020 and 1015 steels (they weigh from ¼ to 2 pounds) are gas carburized in charges averaging 700 to 800 pounds per load. Average monthly production is about 53,000 pounds of steel.

Reheating—Gears are reheated after carburizing in submerged-electrode, neutral-salt-bath furnaces. They're held at 1525°F about 35 minutes for gears of about ½-inch cross section. Heavy-sectioned gears are then direct-quenched in oil. Those of thin section are marquenched in 400°F molten salt, held for 3 to 6 minutes, then cooled in room air. Latter step, which does not require jigs and presses, reduces cracking and distortion rejects.

All carburized and reheated gears are next given a draw (320 to 700°F for 1½ to 2 hours) in either of two, horizontal-oven-type, Forc-Aire furnaces. Gears are loaded in baskets stacked directly on draw furnace hearth. Specifications require minimum Rockwell-A hardness from 80 to 83 and maximum distortion of 0.003 inch.

Furnace—The pit-muffle furnace is versatile. With its atmospheric, two-stage, multiple-injection burners, plus an alloy recirculating fan at base of muffle, a wide-operating temperature range is available. Same unit does low-temperature drawing in addition to gas carburizing.

Fuel savings are realized by using a cooling pit in conjunction with the muffle furnace. Cooling pit and forced convection furnaces also are designed to accommodate the same charge baskets used in the muffle furnace. This permits direct movement of a charge between furnaces without intermediate unloading and reloading operations.

Clean Hardening — Generator housings, gear and jaw forgings, shaft blanks and tools are clean-hardened at the rate of nearly 230,000 pounds per month. Three surface - combustion, horizontal-type, muffle furnaces are used in this operation.

The RX atmosphere gas (150 cfh) is protection against decarburization or scaling of metal surfaces. Gas is manifolded from centrally-located MRX generators.

Typical charge includes generator housings made of SAE 4130 flanges automatically welded to Armco ingot iron bodies. Housings are held at 1650°F for 1 hour in

RX atmosphere, then direct-quenched in oil.

Hardening is followed by a temper at 1050°F in Surface Combustion, Forc-Aire, pit-convection furnaces. Average charge is 15 x 20-pound housings. After holding at 1050°F for two hours, housings are air-cooled and sandblasted. Hardness of 27 to 31 Rockwell C in the steel flange is maintained by spot checking each load.

Forced-convection, pit furnaces also are used for drawing gear blanks, jaw and shaft forgings and for burning off greases and oils resulting from direct oil quenching.

Salt Hardening — Neutral salt hardening of bearings, shafts and liners is also carried out in electric salt-bath furnaces. Bearings of SAE 52100 steel are preheated to 1400°F for 10 minutes, then hardened at 1550°F by holding for 15 to 20 minutes. They are then marquenched in 400°F salt and cooled in room air.

Draw of 350 to 375°F is carried out in horizontal-hearth furnaces. Resulting hardness is held to a minimum of Rockwell C 62 to 65 and checked 100 per cent.

Annealing—Aircraft motor laminations, shafts and yokes are annealed in large quantities in direct-gas-fired, oven furnaces. About 274,000 pounds are treated each month.

Typical charge of special-silicon steel laminations would contain 65,000 parts (1018 pounds) in a specially sealed alloy box. Three boxes are charged at one time. Protective filler is not used. Heat penetration to the center of the charge, to equilibrium, takes about 3 to 4 hours. Charge is then held at 1300°F for 6 hours, furnace cooled to 900°F and finally cooled on a rollout conveyor. Seal is broken at about 400°F.

Lots of small quantity are annealed in the horizontal muffle furnaces. Normalizing at 1650 to 1700°F utilizes the large oven furnaces for large lots and the horizontal muffle furnaces for small quantity requirements.

Atmosphere Generators — Two 800-cfh, MRX, prepared-atmosphere generators of the endothermic type are manifolded to the vertical-muffle, gas-carburizing furnace and cooling pit and to the horizontal-muffle, clean-hardening furnaces.

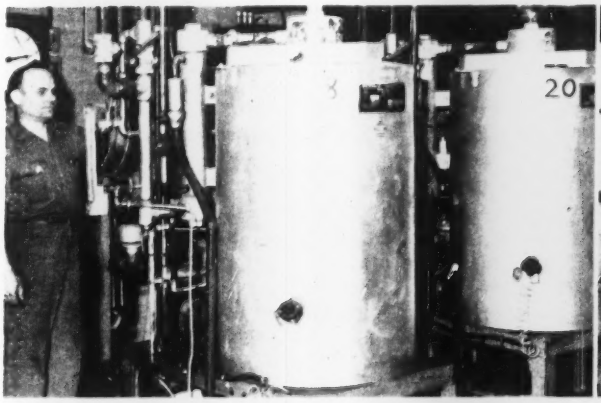
Operation of generators is automatic. A noncombustible mixture of natural gas and air, automatically proportioned, is fed into a catalyst-filled reaction tube. Tube is externally heated by an atmospheric-type ring burner which uses line-pressure fuel gas.

RX gas is produced within the tube by an endothermic or cracking reaction. Constant output of uniform analysis gas is assured, since temperature of the reaction tube is automatically controlled to close limits.

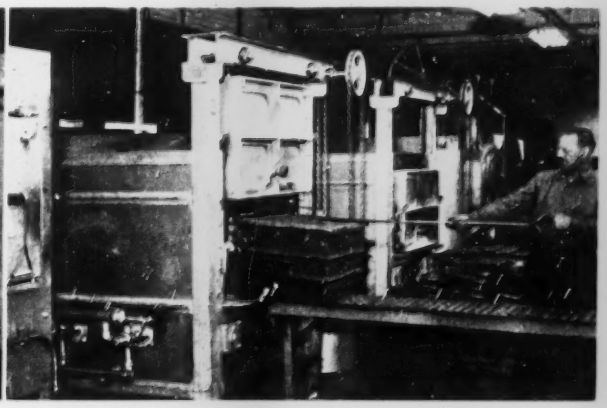
TYPICAL GAS CARBURIZING CYCLE

Step	Furnace and Charge	Prepared Atmosphere
1	Pit furnace at 1500° F	Turn on RX gas, 150 cfh; natural gas, 15 cfh
2	Furnace at 1650° F	Turn off natural gas
3	Charge load (700 to 800 lbs)	Turn on natural gas when furnace reaches 1650° F
4	Hold 1½ hours	RX gas, 150 cfh; Natural gas, 15 cfh
5	Discharge	Turn off natural gas first, then RX
6	Charge cooling pit	RX gas, 200 cfh
7	Cool 2 to 2½ hours	RX gas reduced to 38 cfh 20 minutes before discharge
8	Discharge	Shut off RX gas

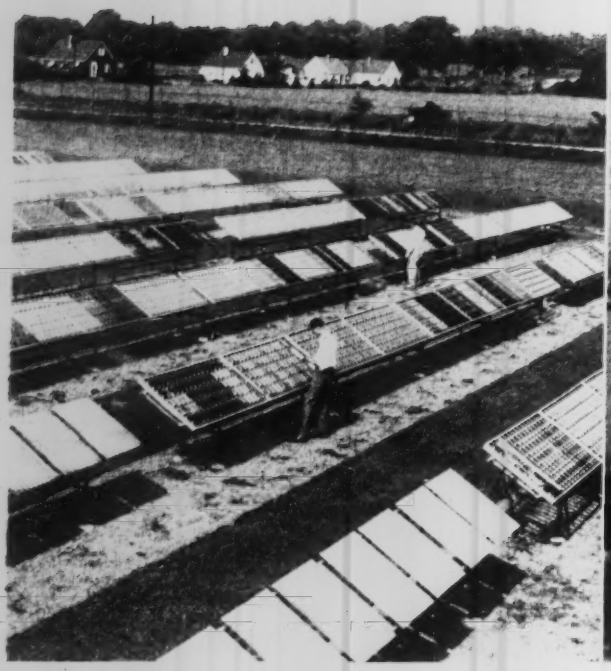
Note: Resulting effective case, with RX gas at +20 to 25° F dewpoint, will be 0.017 inch after 1½ hours at 1650° F. Surface carbon is from 0.90 to 1.00 per cent. At effective depth, carbon content is 0.55 to 0.60 per cent. Dewpoint is checked before charging and every half hour during heat, using dewpoint cup.



Battery of two, 800-cfh, MRX generators are manifolded to widely dispersed furnaces for gas carburizing and clean hardening. Operator is finding the dewpoint



Operator pulling a sealed box of motor laminations after annealing in surface-combustion, direct-fired, large-oven furnace. Boxes will cool on charge table



Armco's corrosion yard at Middletown, O. Here steel samples are exposed to mild industrial atmosphere for long periods. The other yard is at Kure Beach, N. C.

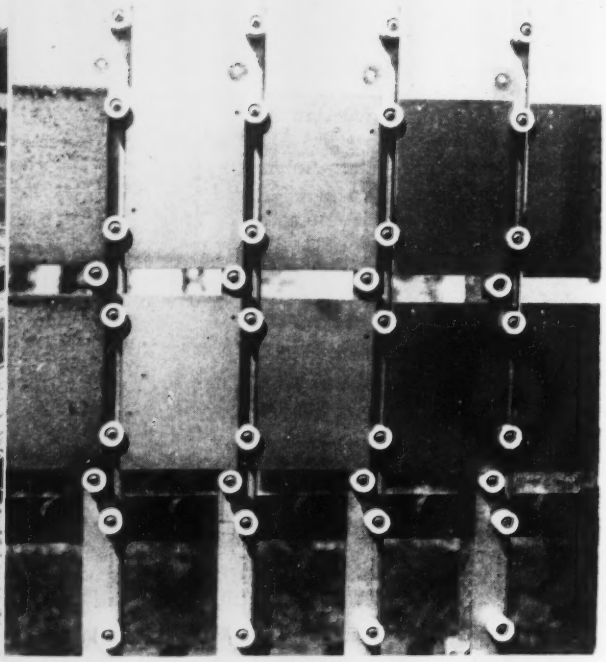


Fig. 2—Two identical rows of samples show importance of chromium. Left to right: 9.5% Cr, 13% Cr, 15% Cr, 17% Cr and 20% Cr. Type 430 is second from right

430 Stainless Is Hardy Civilian

With nickel-bearing steels still on the defense list, Type 430 passes outdoor corrosion tests with flying colors. One exception is severe marine atmospheres

CHANCES are slim that nickel-bearing, stainless steels, such as Type 302, will be available for unlimited, non-defense uses for some time. This means that Type 430 stainless must continue to carry a good part of the civilian load for the stainless family.

So many fabricators are asking: "How well does 430 resist corrosion in atmospheric service?"

They can be assured that it will give a good account of itself in normal outdoor service. In fact, extensive weathering tests reveal only one exception—seacoast service.

As is the case with other stainless steels, appearance and service of Type 430 in outdoor use can be improved by regular cleaning.

Outdoor Stations—Armco Research Laboratories have been conducting corrosion tests on stainless steel for years. Outdoor exposures are carried out in two locations.

One site, a corrosion yard in Middletown, O., has a mild industrial atmosphere. The other corrosion yard is at Kure Beach, N. C., which is only 800 feet from the ocean. Marine atmosphere in this location is severe.

Some of the stainless steel samples tested in both yards are shown on these pages. They are pictured either on test racks or just as they came off the racks. None has been cleaned. Holes in samples were drilled for identification purposes.

Middletown Exposures — In Fig. 2, there are five different alloys containing chromium. Reading from

By A. H. THOMAS
Chief Chemist
Armco Research Laboratories
Middletown, O.

left to right, they are: 9.5 per cent Cr, 13 per cent Cr, 15 per cent Cr, 17 per cent Cr (Type 430), and 20 per cent Cr. Type 302, 18 Cr, 8 Ni, was also on the test rack.

Samples named were exposed for five years at the Middletown yard and bear out how adding more chromium (at least 11 per cent) to steel increases its corrosion resistance.

Alloys which contained 13 per cent or more chromium showed little or no corrosion. Type 430 sample (fourth from left in both rows) compares well with Type 302 stainless.

In this test, both 430 and 302 had about the same appearance as when originally exposed.

Cr Plating—How does stainless stand up against chrome-plated samples? Samples of stainless and chrome-plated bar stock were exposed for 5½ years at Middletown. Latter were commercial-quality, chromium-plated steel.

Comparative results are borne out in Fig. 3. Top left is Type 302; bottom left, Type 304; top center, Type 410; bottom center, Type 430; top right, Type 430F; bottom right, chromium-plated mild steel.

Stainless samples maintained excellent appearance, except for a little dirt that collected on their surfaces. Type 304 (bottom left) and chrome-plated steel (bottom right) showed great susceptibility to attack.

Kure Beach—Condition of four stainless steel samples after exposure of one year in the seacoast atmosphere at Kure Beach is shown in Fig. 4. All samples had cold-rolled finishes.

Samples have not been cleaned, and there is some evidence of surface discoloration on all except Type 316. Spotting on it is due to fingerprints or rain.

All samples were in about the same condition after five months of exposure. Type 430 was more discolored than others, but it stood up well in comparison to Type 304.

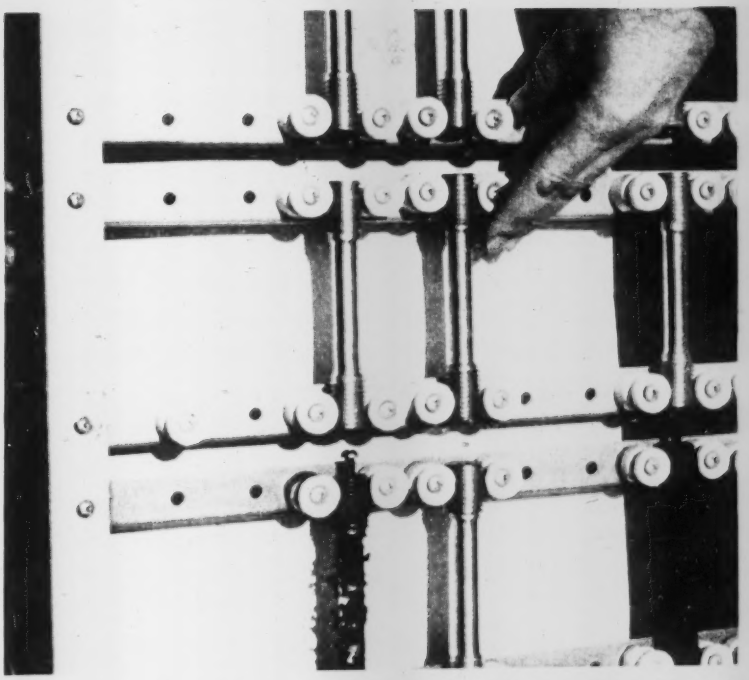


Fig. 3—Comparing stainless and chromium-plated bar, bottom right. Left: Top, 302; bottom, 304. Center: Top, 410; bottom 430; right top, 430F

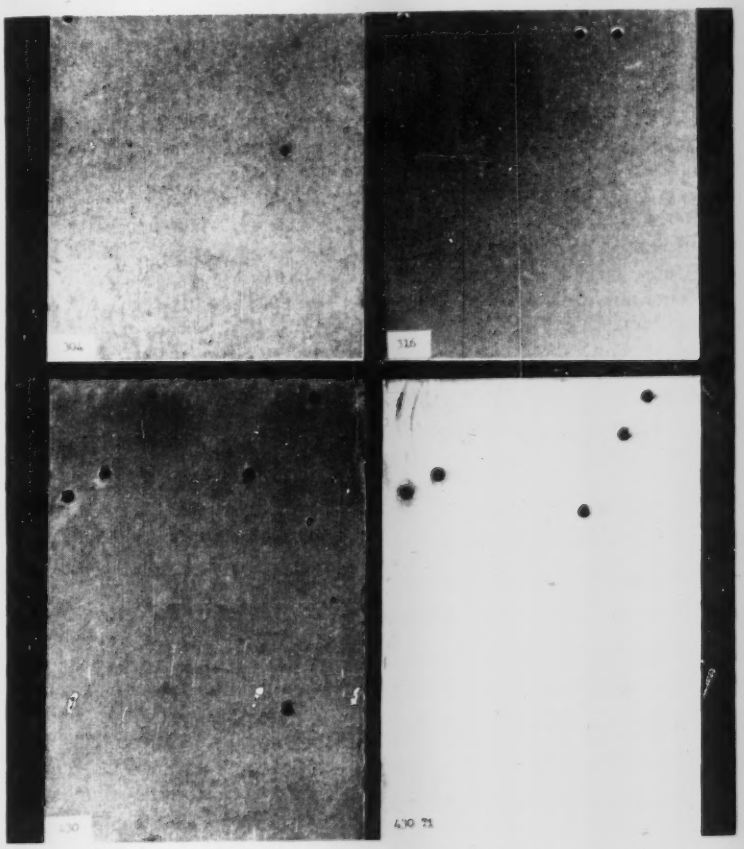
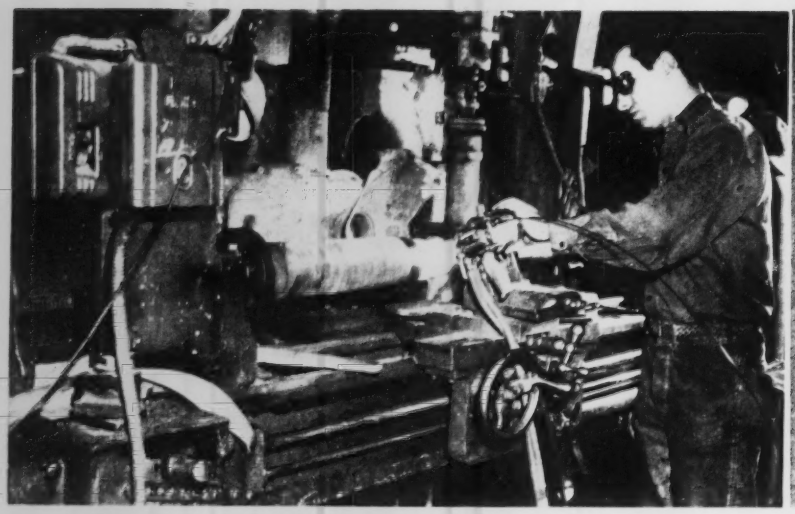


Fig. 4—Samples of four grades of stainless steel after a year's exposure in severe marine atmosphere at Kure Beach. Type 430 is at bottom left



Left—Main housing of a portable power tool is being metallized with molybdenum wire. The coating is porous. Right—Cutaway shaft illustrates metallizing buildup to feather edge

Coating Takes on Life Saving Role

Sprayed molybdenum wire now being used as finish coat for such things as buildup of wear surfaces, restoring of mismachined parts and salvage of equipment

SPRAYED molybdenum wire made its debut several years ago as a foundation material for bonding a coating of a different metal. Today, it's seeing yeoman's service as a finish coat with diversified applications, including buildup of wearing surfaces, restoration of mismachined parts and salvage of old equipment.

Highlight of the process is its simplicity: Part is cleaned or undercut, sprayed, then surface finished. Dovetailing and undercutting often aren't necessary and buildup can be carried to a feather edge.

Danger of warpage is at a minimum, because negligible heat is generated in the part during spraying. In fact, fusion takes place, but it happens so quickly that heat penetration is not deep enough to set up stresses in the base material. For this reason, Sprabond, product of Metallizing Engineering Co. Inc., Long Island City, N. Y., is likened to a cold weld material.

Squeeze Play—Probably one of the top applications is adding longevity to bearing surfaces. Molybdenum coatings combine hardness with lubricant-holding porosity.

Company that worked grinding machines at close tolerances was faced with short spindle life, because split-bronze spindle bearings were kept snug. Satisfactory service of more than a year was reported after worn spindles were coated with molybdenum wire. Bronze sleeve bearings also lasted longer.

Erasing Mistakes—Another successful application is of an emergency nature. When parts are mismachined, dimensions can be restored by resurfacing damaged areas.

Stub axle from 5-inch by 30-inch bar stock, for instance, was mismachined undersize at one of the bearing fits. Part was set up in a lathe, cleaned with emery cloth, then sprayed for about 10 minutes, to bring the undersized area to the required dimension, with allowances for finishing. Restored sections are said to have longer service life than unmetallized parts.

Salvage—Rejuvenation of worn parts is a common task for molybdenum coatings. Case-hardened, tool-steel spindles on nylon twisting machines, for example, tend to wear in from three to five spots.

This is the salvage procedure: Spindles are cleaned with a grease solvent, undercut 0.015 inch, metallized to 0.030 inch over required finish diameter, then ground to finish size.

Undercoat—When the product is used as a foundation coat, preparation of base surface is generally confined to a thorough cleaning. After coating of from 0.00150 to 0.002 inch, surface is ready for metallizing with steel, stainless, nickel, aluminum, bronze or other metals.

In some cases, grooves or threads are advisable, particularly where bond will be highly stressed. Cases in which grooves are needed include: Coatings which are over 0.050 inch and have an edge, such as a keyway, and where there is danger of layer separation in coating.

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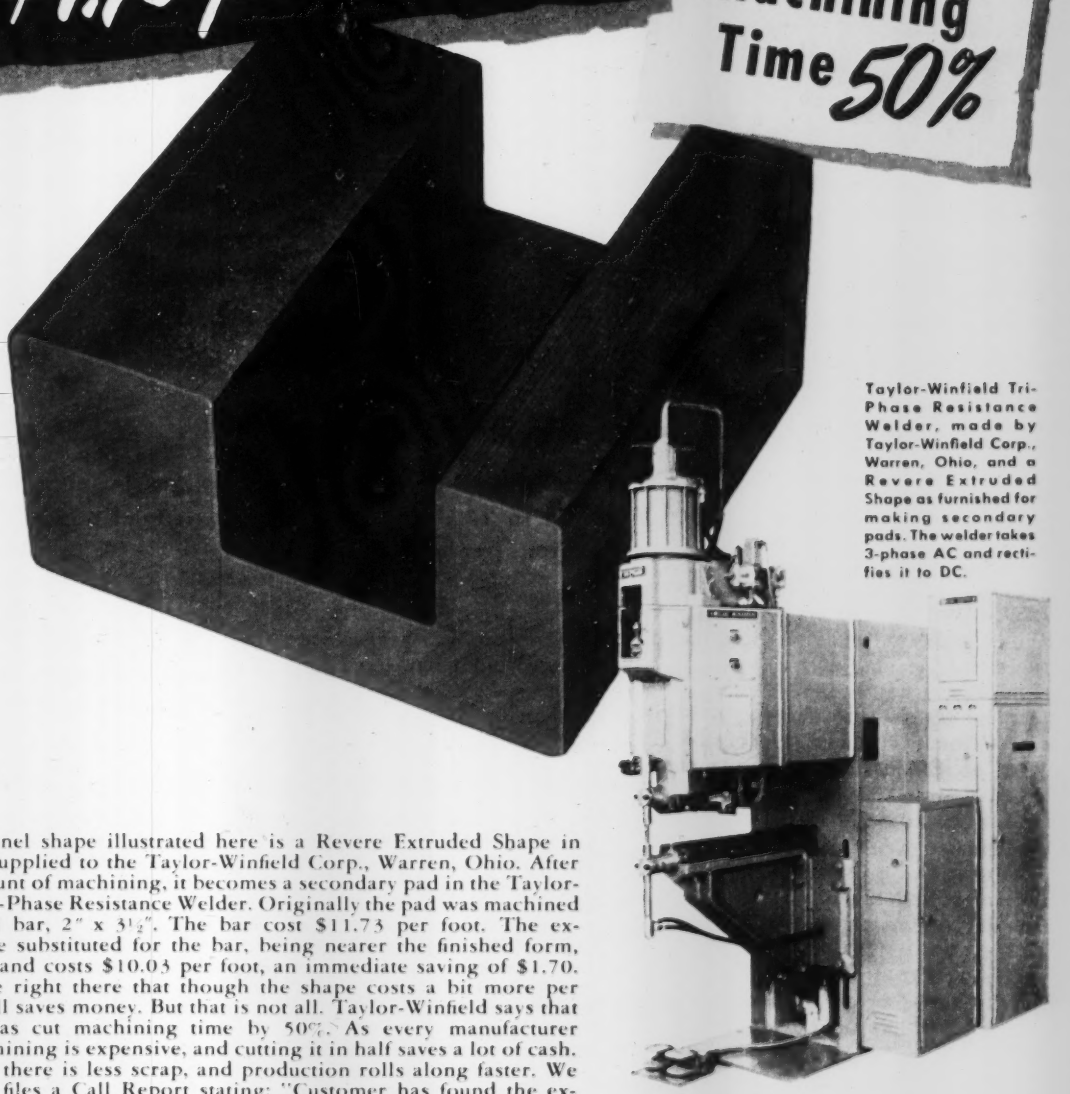

Taylor-Winfield Tri-Phase Resistance Welder, made by Taylor-Winfield Corp., Warren, Ohio, and a Revere Extruded Shape as furnished for making secondary pads. The welder takes 3-phase AC and rectifies it to DC.

● The channel shape illustrated here is a Revere Extruded Shape in copper, as supplied to the Taylor-Winfield Corp., Warren, Ohio. After a small amount of machining, it becomes a secondary pad in the Taylor-Winfield Tri-Phase Resistance Welder. Originally the pad was machined out of solid bar, 2" x 3½". The bar cost $11.73 per foot. The extruded shape substituted for the bar, being nearer the finished form, weighs less and costs $10.03 per foot, an immediate saving of $1.70. You can see right there that though the shape costs a bit more per pound, it still saves money. But that is not all. Taylor-Winfield says that the shape has cut machining time by 50%. As every manufacturer knows, machining is expensive, and cutting it in half saves a lot of cash. In addition, there is less scrap, and production rolls along faster. We have in our files a Call Report stating: "Customer has found the extruded section very satisfactory, and bases his machining time-saving on production runs and not estimates."

Credit for this fine achievement has to be shared by a number of people, both in Taylor-Winfield and in Revere. Our Sales and Technical Advisory staffs collaborated closely with the customer's engineering, production and purchasing personnel. Everybody considered all angles, and worked out this money-saving plan.

So we suggest that if you are doing any extensive machining of copper and copper alloys, or aluminum alloys, it would be a good idea to look into Revere Extruded Shapes. They might offer you important economies. We will be glad to consult with you. Just get in touch with the nearest Revere Sales Office.

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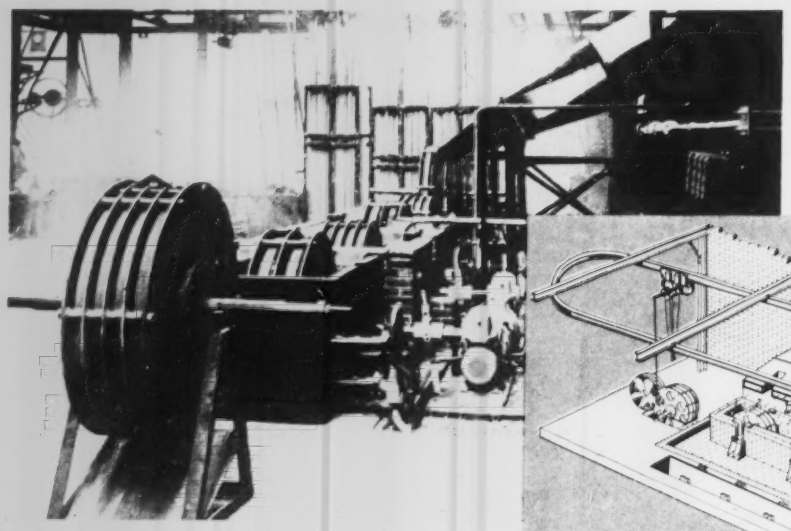
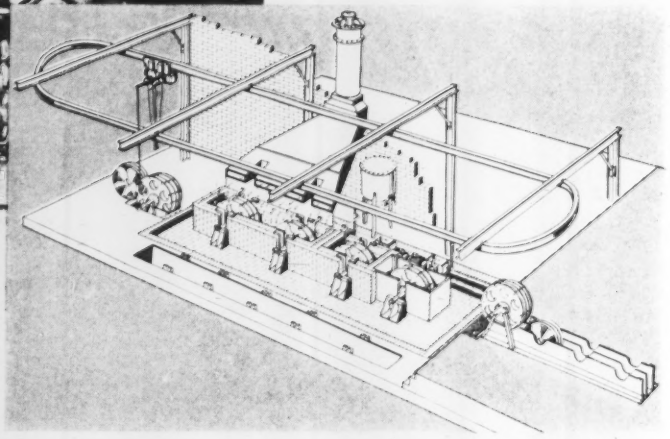




Prospective drawing and closeup of actual rotary pickling setup show how little equipment is necessary in treating large tonnages of coils. Cage in the foreground is partitioned to handle four coils of narrow strip

Coils Spin

THROUGH ROTARY PICKLER

Unique principle makes low-cost pickle installations possible. Coils up to 24 inches wide can be cleaned and oiled at better than 3 tons per hour

LOW-COST pickling plants, enabling users of coiled strip to do their own cleaning and oiling economically, are a reality. The system is designed to handle anywhere from 5000 to 18,000 tons per year of commercial grade, hot-rolled strip in widths from 2 to 14 inches and in gages from 0.042 to 0.188-inch.

Developed in England, where several plants are already in operation, equipment manufacturing rights for North America have been acquired by Yoder Co., Cleveland. This company is now offering plants of improved design, with widths up to 24 inches and correspondingly higher tonnages.

Different Principle—The rotary pickling idea operates on an entirely different principle which permits the job to be done with surprisingly little equipment. Coils are loaded into cages and rotated at about 20 rpm while submerged in the tank liquid.

Separate tasks of uncoiling, scale breaking, loose coiling and pinning, heretofore essential steps in coil pickling operations, are all performed with minimum hand labor in the almost-automatic cage rotating operation. Unwinding is accomplished by revolving the cage in direction opposite to that of the coil windings.

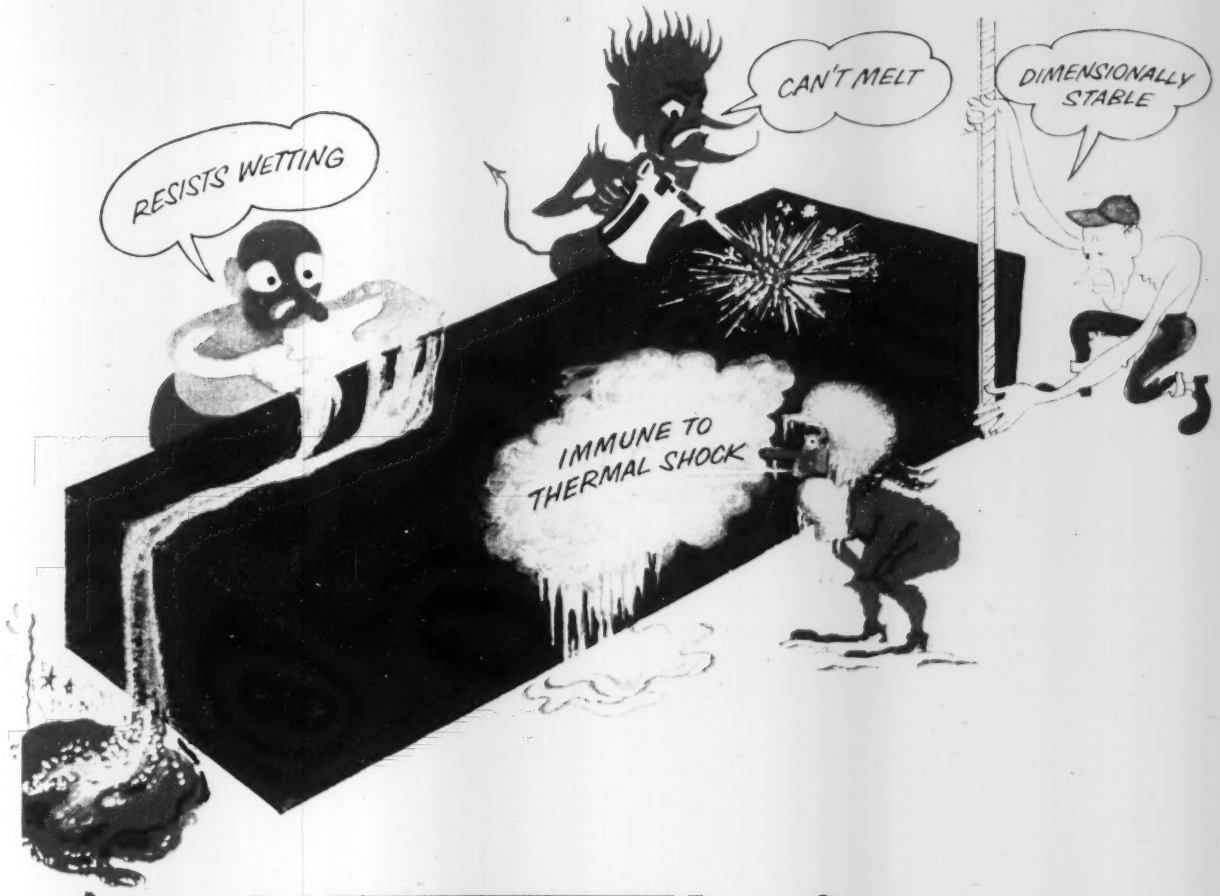
Cycle Repeated — This rotation of the cage tends to carry the coil around with it, but it is resisted by the weight of the coil which remains near the bottom of the cage while its leading end is being carried around with the cage. This causes the strip to be unwound, wrap by wrap, rearranging itself against the cage rim until coil is unwound.

At this stage the direction of rotation is reversed, and the coil begins to rewind. At the completion of this rotation, coil is restored very nearly to its original diameter and tightness of winding. This cycle is usually repeated once, or several times, depending on the strength and purity of the acid solution.

Loosens Scale—Repeated flexing of the stock in unwinding and rewinding the coil loosens the scale, thus facilitating its complete removal by the acid. At the same time, the violent agitation of the liquid resulting from the revolving cage increases the efficiency of the acid in dissolving, loosening and removing scale. Thus the pickling is completed in 15 to 30 minutes.

Each coil is then transferred to the adjoining rinse water tank where the cage is again rotated, and the coil again unwound. Cage carrying the unwound or expanded coil now goes to the oil bath for rotation in opposite direction and rewinding to its original size, ready for use.

Production Rate—With a cage load of about 2500 pounds of 14-inch wide strip, an average production rate of three tons per hour may be maintained. This estimate presupposes a change of acid once in 8 hours. With wider cages, correspondingly higher production will



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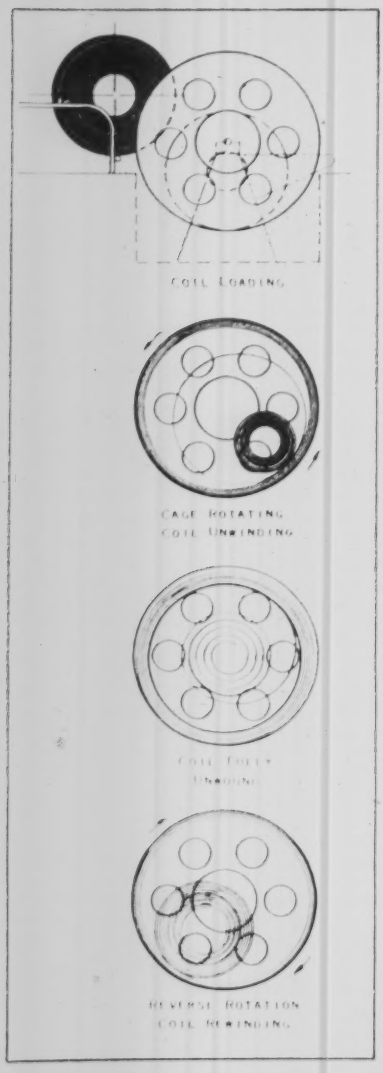


Four ghost drawings show position of coil at various stages in rotating

be obtained. Some of the cages have one central partition, capable of holding two coils side by side, and others have three partitions for holding four coils.

Tanks are built deep enough to prevent splashing over their edges; a high-velocity overhead exhaust system removes the fumes from the acid portion of the system. Individual 5-hp motors drive the cages through gear reducers, heavy clutches and trunnion shafts.

Provision is also made for maintaining the temperature of the acid solution between 165 and 185° F, as well as for emptying and refilling the tanks, neutralizing and disposing of the waste liquids.

Rolls Form and Bend Stainless Molding

STAINLESS auto body moldings, formed to many different sections needed in large volume, are among products turned out by Turnstedt Division, Detroit. Production starts with prepolished coiled strip, fed through rolls set to yield required sectional shape. Final pair of one setup is seen at right in the illustration below.

If the order calls for straight lengths, they are merely cut off as the shape issues. However, molding often must be given a bow, sometimes in more than one place, to fit a curved door or other body panel. This requires shaping to specified contour without producing wrinkles or kinks at bends.

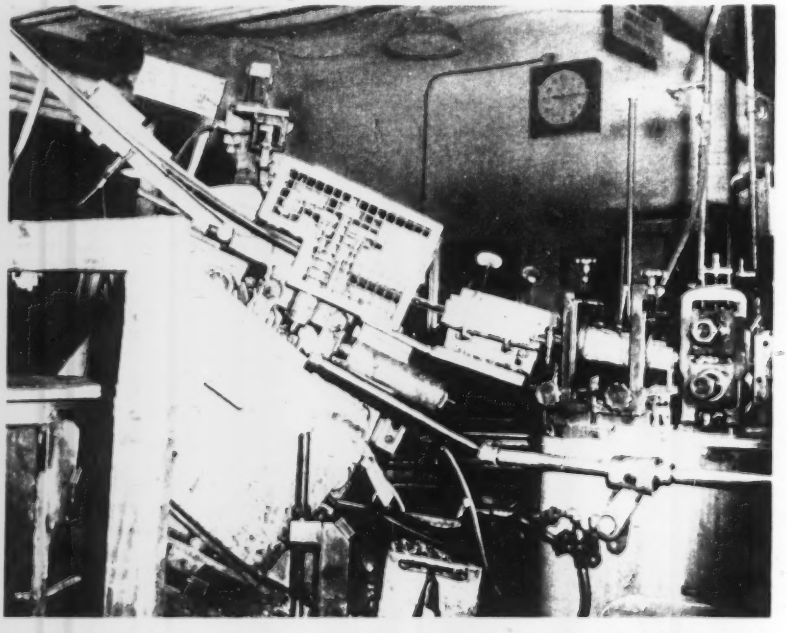
Continuous Dies—Such bends are often made today in special forms of continuous dies through which formed strip is passed immediately after it issues from the forming rolls. Brass or bronze dies are split along a contour or parting that is given a suitable shape to stretch the metal at the outside of the head and compress it correspondingly at inner radius.

Die halves are held together by screw clamps and by properly adjusting pressure desired radii are produced. Two such dies are seen above, as well as a solenoid-operated flying cutoff.

No Interruptions—As curved molding issues from the dies, it is guided along a track appropriately shaped. When specified length has passed through the dies, outer end of the strip trips a limit switch that actuates in turn the solenoid and the shearing jaws. They sever the strip, but do not interrupt continuous travel of unsevered strip. Several lengths fall or are lifted free and occasional pieces are checked on templates for adherence to specifications.

If temper and other factors remain substantially constant, the run is continuous. But if metal conditions change, occasional adjustment of the setup is required.

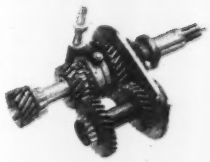
Qualifications—Generally, rapid and uniform production is attained without using an independent bending machine. Because the processing is continuous, the division reports it is efficient. But, like all such processes, Turnstedt says it still has limitations that prevent its use except when conditions appear favorable. Skilled labor is required for operation.



Setup employed for continuous forming and contour bending of stainless moldings from strip stock. Special split dies are adjusted to yield long radius bends

gears and gear assemblies

bevel gears for all industry

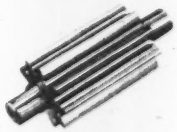


gears and gear assemblies for farm implements and tractors

make AMgears
your
gear department

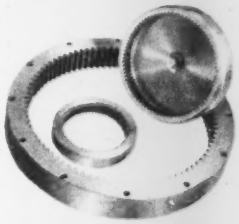
for power shovels

"Air Spec" gears

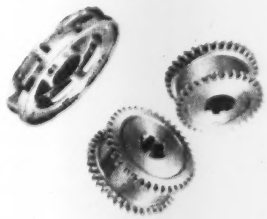


ground tooth pump gears for diesel engines

"Air Spec" worm gears



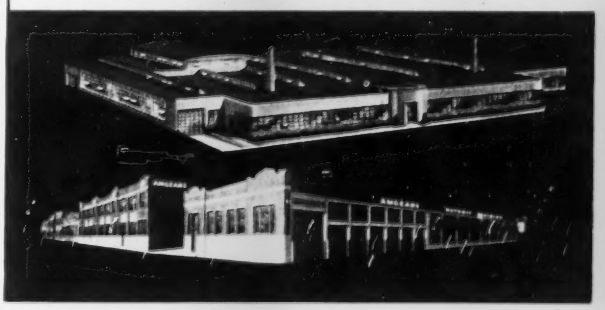
internal gears for engines and transmissions



special gears and gear assemblies

AM ACCURATELY MADE gears, INC.
A SUBSIDIARY OF HUPP CORPORATION

CLEVELAND • DETROIT • CHICAGO



2 big plants for gears and gear assemblies with a customer list that reads like Who's Who in American Industry.

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DETROIT 7450 MELVILLE, DETROIT 17

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UNITED STATES STEEL

NEW PRODUCTS and equipment

Reply card on page 101 will bring you more information on any new products and equipment in this issue

Carbide Belt Finisher

. . . without diamond wheels

Finishing machine, using abrasive belts, makes possible final finish of single point carbide tools without diamond wheels and without highly skilled operators. Model 454 is used for final finishing with an abrasive belt after rough

grinding with a silicon carbide wheel. It features tungsten carbide faced platen that permits finishing of end, top and side clearance angles.

There is nothing new for operators to learn. One setting is applicable for all size tools, and belts can be changed without disturbing the setting. Hammond Machinery Builders Inc., Dept. ST, 1600 Douglas Ave., Kalamazoo, Mich.

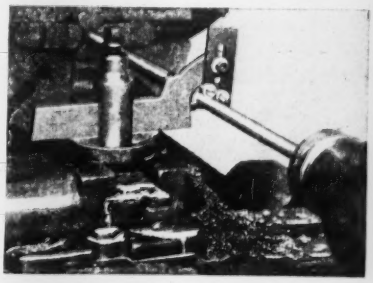
FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Follow-Rest Tool Holder

. . . turns long shafts quickly

Tool holder and follow-rest combination is built especially for turning long, small-diameter shafts quickly and easily. The tool is adjusted instantly by dropping roller plate on the shaft and tightening a single screw. Rollers prevent the shaft from chattering, springing out or climbing over the tool bit while being turned.

The follow-rest is applicable for turning shafts up to 1½ inches in diameter. Close diameter tolerances can be held the entire shaft length. Use of bulky machine steady-rests is eliminated. Pull-Gear Co., Dept. ST, 4118 E. 8-Mile Rd., Detroit 34, Mich.

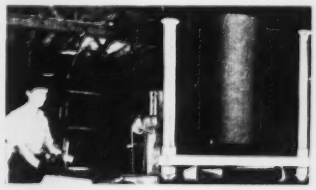


FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Triangular Coil Rack

. . . hoisted from any angle

Paltier triangular coil rack has three-point suspension to gain stable stacking, can be picked up from any angle and is reported to



stack empty in less floor space than conventional units. Racks can be moved easily by fork lift, hand pallet truck or overhead hoist.

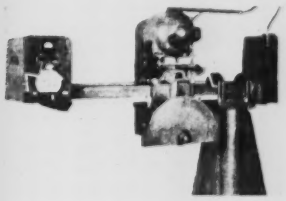
With wood or steel rectangular or square deck, unit can be converted into a standard rack for storing small, irregular - shaped parts, cartons or other shapes. There are no standard sizes or load capacities in this type. Thus, all racks are produced to user's requirements. Paltier Corp., Dept. ST, 1701 Kentucky St., Michigan City, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Abrasive and Friction Saw

. . . for fabricators, warehouses

This high-speed abrasive and friction saw mounted to traverse on a rigid rail has all controls grouped in the operating head where the operator can watch work



and control all operations. Model 111-D can be used as an abrasive saw, producing accurate 90-degree cuts up to 24 inches. Extended rail model makes up to 48-inch cuts. Model is available with or without vise and table arrangement. Ty-Sa-Man Machine Co., Dept. ST, Knoxville 1, Tenn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

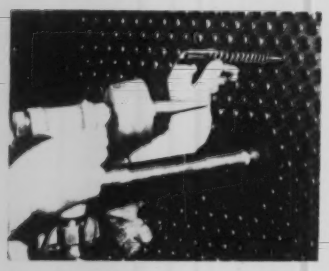
Condenser Tube Cleaner

. . . shoots brushes through tubes

This condenser tube cleaner consists of a combination of spirally-wound nylon brushes and an improved aluminum gun. The spiral design of the brushes produces a spinning, scouring motion. This, with the flushing action of water from the gun, removes sludge and other soft deposits from small tubes, such as those found in condensers and heat exchangers.

Brushes have rubber bumpers or plugs at either end which are of

slightly smaller dimension than the tube to permit water to pass and impart the spinning action to a closer-fitting brush. Brushes



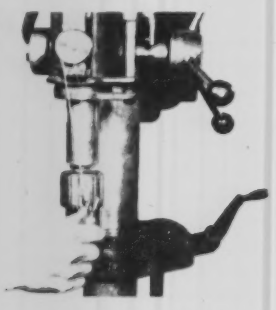
cannot stick in the tubes or injure them in any way. Air can be used as the operating medium, although water is preferred because of its flushing action. Lagonda Division, Elliott Co., Dept. ST, Springfield, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Key Chuck Attachment

. . . no misplaced keys

Chuck keys cannot stray or be misplaced when this attachment is fastened to drill presses to keep keys where they belong. Key-Bak



is a key-roll with strong Swedish clock spring mechanism, 24-inch long steel chain and polished chromium case. Lummis Mfg. Co., Dept. ST, 2242 E. Foothill Blvd., Pasadena 8, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Air-Powered Broaching Fixture

. . . holes, keyways, contours

This air-powered broaching fixture, horizontal and self-contained, will broach holes, keyways and contours on a wide variety of production parts. The compact unit consists of a cast iron base with two integral vertical flanges.

Fixture has a 1400-pound pull capacity with 80 psi air line pressure. Rate of travel is adjustable

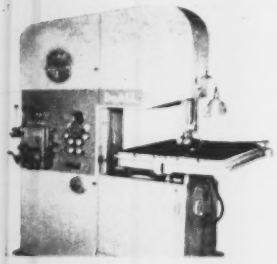
through a control valve in the hydraulic cylinder end. Cycle time to rough and finish valve spool hole in the tractor part illustrated is 15 seconds. National Broach & Machine Co., Dept. ST, 5600 St. Jean, Detroit 13, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Metal-Cutting Band Saws

. . . with high-speed steel band

Band machine line places emphasis on production sawing applications. Greater rigidity, wider



speed ranges and versatility in hydraulic controls are important design features. Hydraulic feed table, for example, is infinitely variable as to rate of feed and feed pressure, and is adjustable in stroke.

Used with the machine line is the manufacturer's development in high-speed steel saw blades. The latter is capable of cutting materials, such as Ampco bronze, which in the past have presented cutting problems. DoALL Co., Dept. ST, 254 N. Laurel Ave., Des Plaines, Ill.

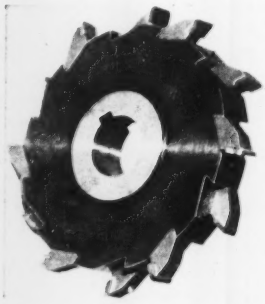
FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Milling Cutter Line

. . . experimental, production jobs

Addition of extended-width slotting cutters to standard milling cutter line employs a stagger tooth method of mounting replaceable blades that allows the manufacturer to make any width cutter desired.

Two standard blade sizes are used. Standard A size is used for cutters from ½ to ¾-inch wide;



all cutters over ¾-inch wide are made up by using B size blade. Millit Inc., Dept. ST, 55 Flint St., Rochester 8, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Explosion-Proof Containers

. . . spray insulating plastic

Plastic sprays, available in clear black, white and aluminum, are repackaged in explosion-proof cans that spray by pushbutton. Safety valve releases pressure when temperature reaches 210° F.

All colors dry in 5 minutes or less. Acrolite spray can be used

for waterproofing and insulating wire and ignition systems, or to prevent rusting and tarnishing of metals. Acrolite - International, Dept. ST, 12 Hollywood Ave., Hillside, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Milling Machine

. . . automatic tracer controlled

This milling machine, the Kellet type BG-21, is specifically designed for electric tracer control

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if you have trouble meeting precision tolerance specifications.

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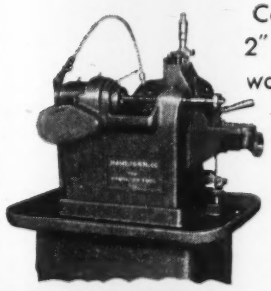
THREE *PRECISION* MACHINES to meet your every requirement.

HAMILTON No. 00

For the generation of spur gears and pinions only.

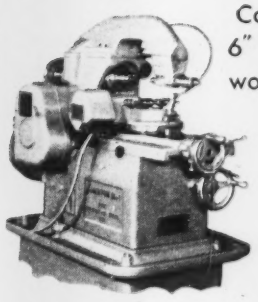
Capacity: 2" O.D. of workpiece.



HAMILTON No. 1

Hobs spur and spiral gears, worm gears and worms (to three thread), splined shafts, gear sectors, and pinions.

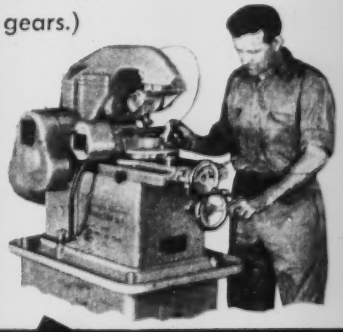
Capacity: 6" O.D. of workpiece.



HAMILTON No. 1-B

Generates any shape that can be made on the No. 00 or the No. 1 machines, *plus* bevel gears and face gears.

Capacity: 6" O.D. of workpiece (3" O.D. by 3/16" face, for bevel gears.)



Exclusive Greater range of hob spindle speeds: 109 to 1259 R.P.M. — 12 speeds.

Exclusive Speed, feed, indexing. *Each can be selected independently.* This, and wide range of hob speeds, adds flexibility; reduces set-up time; gives quick selection of speed and feed to suit material and gear size.

Exclusive Alignment and trueness of work and hob spindles are held to within .0002".

Exclusive Generates gears from 3 teeth to 1200 teeth.

Exclusive Accumulative error of not more than .0002" guaranteed.

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TUBE DIAMETER O.D. SIZE	MAXIMUM WALL DECIMAL	MAXIMUM WALL B. W. GAUGE	MINIMUM WALL DECIMAL	MINIMUM WALL B. W. GAUGE
1/2"	.065"	16	.028"	22
5/8"	.065"	16	.028"	22
3/4"	.065"	16	.028"	22
7/8"	.083"	14	.028"	22
1"	.109"	12	.028"	22
1 1/8"	.109"	12	.028"	22
1 1/4"	.134"	10	.028"	22
1 3/8"	.134"	10	.035"	20
1 1/2"	.148"	9	.035"	20
1 3/4"	.148"	9	.035"	20
1 7/8"	.165"	8	.035"	20
2"	.165"	8	.035"	20
2 1/4"	.180"	7	.035"	20
2 1/2"	.203"	6	.035"	20
2 3/4"	.203"	6	.035"	20
3"	.220"	5	.049"	18
3 1/4"	.220"	5	.049"	18
3 1/2"	.238"	4	.049"	18
3 3/4"	.238"	4	.049"	18
4"	.238"	4	.049"	18
4 1/4"	.250"	4	.049"	18
4 1/2"	.250"	3	.065"	16
4 3/4"	.250"	3	.065"	16
5"	.180"	3	.083"	14
5 1/2"	.180"	3	.083"	14

"Intermediate sizes within the range indicated can also be manufactured. Please consult us for sizes not listed.

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½" to 3" O.D. . . .035 to .072 wall

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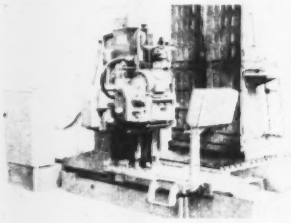
EQUIVALENT SQUARES, RECTANGULARS AND SPECIAL SHAPES ARE ALSO AVAILABLE.

NEW PRODUCTS and equipment

However, the model may also be used as a regular milling machine. Work can be done in two ways: Following a sheet metal template or side walls of a model with a



profiling tracer and cutting the duplicate shape with the side of an end mill; or by using a three dimensional tracer to follow a full model in a series of parallel passes with the spacing preset by the operator.

Construction is horizontal, thus providing maximum support for the spindle head. Because work holding table is stationary and spindle head carries the cutter along the work, movable weight is always constant. Lubrication is simplified by central oiling system. Pratt & Whitney, division of Niles-Bement-Pond Co., Dept. ST, W. Hartford 1, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Compact Extrusion Press

. . . features faster cycling

This extrusion press features faster cycling, is reported to be one

of the most compact in the extruding field. Butt shear is mounted internally and is fully supported

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70. Guide to Slitting

Ohio Knife Co.—"Slitting—A Basic Guide for the New Operator" is a comprehensive 24-page illustrated manual which presents much information on this operation and the equipment required to do it. Procedure for setting up a job, care of equipment and helpful hints are included.

71. Gap Frame Presses

Niagara Machine & Tool Works.—Inclinable and noninclinable series of gap frame double crank presses is subject of 28-page illustrated bulletin No. 65-B. Design features are outlined and specifications for each model are given. Mechanical sleeve clutch is standard on 3, 3½ and 4-in. shaft presses, while air sleeve clutch is offered on 4½, 5, 5½ and 6½-in. shaft models.

72. Twist Drills

DoAll Co.—16-page illustrated catalog No. 51-816 covers a variety of standard and special drill types of straight and taper shank designs. Countersinks, Morse taper extension sets, sleeves, holders and similar accessories are also discussed. Drill pointing and web thinning instructions are given.

73. Metallizing

Metallizing Engineering Co.—Wide range of practical applications of metallizing in machine element maintenance and repair, production, production salvage and corrosion prevention is covered in 8-page bulletin 51A. Repair of worn crank shafts, pump packing sleeves, press rams, turbine roters and stators, rolls, motor shafts, pistons, cylinders, etc., is shown.

74. Control Centers

Westinghouse Electric Corp.—Three types of control centers are described and various electrical components that make up typical units are illustrated and defined in 31-page booklet B-5621. A three-step building-block system of planning centers is given, along with check charts to aid selection of right arrangement. Reference tables for selecting starter size are provided.

75. Drawing Compounds

Fiske Brothers Refining Co.—Metal drawing compounds are the subject of 4-page folder No. 102-810. Eight typical compositions from a complete line are described in detail, and their uses shown.

76. Unit Bundling

Signode Steel Strapping Co.—"6 Basic Ways of Unitizing" is title of 12-page folder briefly describing six ways of unit bundling or packing to facilitate truck handling. Steel strapping methods pictured show how to "unitize" many pieces, packages or products into a single, compact, movable load.

77. Compressors

Cooper-Bessemer Corp. — Wide choice of compressor cylinders which permit any desired combination of volume and pressure within the limits of the frame's horsepower rating are available for the M-line of multistage, multicylinder compressors described in 11-page illustrated bulletin M-70. Horsepower ratings are from 100 to 5000 with speed of 250 to 514 rpm.

78. Steel Plate Fabrication

Biggs Boiler Works Co.—Facilities for fabricating heavy-gage steel plate into such products as lined chemical tanks, pressure vessels, rotary kilns, driers, and cable drums are illustrated in 8-page folder No. 551. Stainless, carbon-moly, coated, clad or mild steels are welded or riveted to ASME specifications.

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79. Welded Tank Cars

American Car & Foundry Co.—All-welded, standardized design tank cars are described and illustrated in 20-page, illustrated bulletin 53-TC. Design features, optional equipment and construction are covered. Included are heated and unheated, insulated and uninsulated cars of steel and aluminum for carrying various products.

80. Industrial Crayons

American Crayon Co.—Old Faithful markers for all kinds of surfaces and conditions are described and their applications shown in 16-page Industrial Crayon Guide. They make permanent, semipermanent or temporary marks on hot or cold metal, wood, paint, glass, paper, leather, etc.

81. Industrial Elevators

Barrett-Cravens Co.—Complete line of industrial elevators and portable cranes is detailed in 36-page bulletin 5211. Portable elevators are hand and electrically operated and have various capacities and features. Specifications of all equipment are given.

82. Coil & Sheet Slitters

Yoder Co.—For metal, plastic, rubber and other coil and sheet, slitters and related items such as coilers and scrap choppers are described in new catalog. Design, selection and operation of equipment is given, together with time studies of operating cycle.

83. Recirculating Furnaces

Despatch Oven Co.—Gas and electric fired recirculating furnaces for both laboratory and production use are found in 20-page illustrated bulletin No. 81. More than 30 units are available, with standard maximum temperatures to 1250° F. Bulletin gives construction, application and other data.

84. Sectioned Storage Shelters

Yard-Stor Shelter Co.—Advantages of curved-section storage shelters, consisting of independent identical sections mounted on track to form a building, are enumerated in 8-page folder. Sections tilt, telescope, nest or slide apart for easy access.

85. Machine Tools

Cincinnati Milling Machine Co.—In 52 well-illustrated pages, bulletin M-1776 shows the complete line of company machine tools, including various grinders and millers, flame hardening, and metal forming machines. Condensed specifications are given for all units. Grinding and cutting wheels, cutting fluids and other accessories complete this products story.

86. Motor Controls

Allen-Bradley Co.—In 28 illustrated pages, new bulletin deals with motor controls for all industrial applications. The most important items in the company's standard line are outlined, and applications listed. Accessories are also included. Company facilities are illustrated.

EDITORIAL ARTICLES

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87. Industrial Movies

Value of industrial movies taken in the plant to study faulty action and points of wear on machinery, manual operations, evaluation of individual performance and flow analysis is pointed up in STEEL article "Movies Add Dimension to Plant Picture," by R. H. Stearns. Standard camera speeds and a checklist for taking movies are suggested.

88. Production Control

Procedure which substitutes "group numbers" for calendar dates in setting up production schedules is explained in STEEL article "Production Control . . . Number System Is Better Than Dates," by F. M. Gilbreth, McKinsey & Co. consultant. Manufacturing control is easier as well as schedule changes and expediting.

89. Carbon Steel Bars

Behind the volume production of carbon steel bars lies an equally impressive number of decisions confronting the user in choosing the right grade and type to fit his needs. Part I of STEEL article by G. P. Witteman, metallurgical engineer at Bethlehem Steel, is intended to be a "Guide for Selection of Carbon Steel Bars."

90. Stainless Output Doubled

By taking advantage of a hillside site, Allegheny-Ludlum gets an easy flow of materials at its Watervliet electric melt shop. It was designed for a large variety of quality steel. Read STEEL article "Gravity Helps Double Stainless Output."

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1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

STEEL

Penton Building, Cleveland 13, Ohio

9-28-53

Please send literature or detailed information on subjects circled at left to—

during the entire stroke with positive die positioning. Shear is supplied from auxiliary high-pressure system. Double gate locks give full bearing around the die slide.

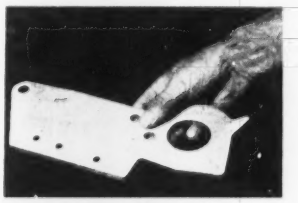
Other features include mounting completely assembled on an integral base ready for field connections, high-pressure clamping during the entire extrusion stroke to minimize flashing and a fully accessible die slide for rapid change. E. A. S. Co. Inc., Dept. ST, Youngstown, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Improved Die Cutting Method

. . . tolerance: ±0.001-inch

Improved method of producing die cut parts permits size and location of pierced holes to be held to tolerance of plus or minus 0.001-inch. Process lends itself to die-producing of all sheet materials that



can be stamped, such as sheet and alloy steel, nonferrous sheet materials including fiber, bakelite and other sheet stock.

Practically any gage can be blanked and pierced to desired shape and size, from 0.001 to $\frac{3}{8}$-inch thick. Dayton Rogers Mfg. Co., Dept. ST, Minneapolis 7, Minn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Adjustable Drill Guide

. . . for hand tools or presses

Sine adjustable drill guide is adaptable to portable power tools or drill presses. Its depth stop can be adjusted to any desired

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

any forging can be yours in a hurry

In our 63 years of serving industry, we've found that a forging is the one thing you need in a hurry—and we've geared our plant to give you the fastest delivery possible. For instance, our shop is not burdened with the production of stock items; it operates around the clock to turn out the rush forgings that save you down-time and lost production. You see, forgings are our business—and when you need them in a hurry, you need only to ask for fast service. Remember—when the lack of a special forging threatens to slow your production, think first of American Forge.

American Forge and Manufacturing Co.

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Forged shafts • pinions • gear blanks • steel rings • connecting rods • discs • heavy bolts up to 6" dia. • 5 to 100 ton capacity mill hooks • ratchets • load binders • hand and automatic tongs to your specifications

"Forgings for Industry since 1890"

depth from ¾-inch on hand tools to 1¼-inch when mounted on a drill press. Made of aluminum for lightness and toughness, the guide should be valuable wherever large number of small diameter holes

must be drilled. Using the attachment, it is unnecessary to use drill bushings in the jig plates since the pilot is designed to accept desired drill size and thus takes the place of the bushing.

Jig plate can then be made of cold rolled or fabricated steel, or plastic, with reamed holes to accept the pilot tip. E & E Engineering Co., Dept ST, 15023 Harper Ave., Detroit 24, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Granite Surface Plates

. . . reference plates in layout

Surface plates are made for use as reference plates in layout, inspection and assembly work. Plates are made from Barre, Vermont,

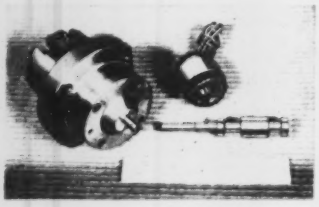
Rock of Ages granite, are guaranteed by the manufacturer for precision surface. Bryant Chucking Grinder Co., Dept. ST, Springfield, Vt.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

High-Speed Motor

. . . two standard blade sizes

High-speed motor line, as supplied previously on the manufacturer's internal grinding machines, is available for experimental and production applications. To permit small holes to be ground with small wheels at about 600 sfm motors are built to rotate at speeds to 100,000 rpm. Hi-frequency motors are simple, compact units.



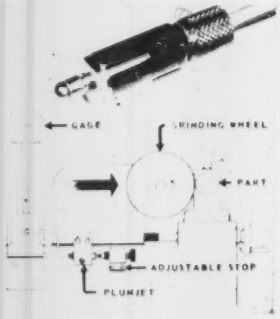
Rotor is mounted directly on spindle and is the only moving part of the driving motor, since there are no brushes or moving contacts. Stator, carrying motor windings, is cooled by water jacket. Lubrication is provided by an oil mist carried in a stream of air. Motor is totally enclosed and remains clean indefinitely. Bryant Chucking Grinder Co., Dept. ST, Springfield, Vt.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Metal Removal Gage

. . . simplifies visual indication

A simple and accurate way to gage removal of metal to the last few tenths without stopping the machine or removing the part is



provided by this gaging setup. Plunjet gaging cartridge is connected to a column-type air gage and mounted on the infeed slide so it indicates against a fixed adjustable stop attached to the stationary part of the machine. As a result, any movement of infeed slide is transmitted to the gage, where it is amplified and indicated by position of the float.

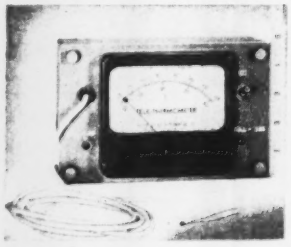
This amplified visual indication of slide movement permits an operator to make precise slide movements with ease and assurance since he knows when the part is reaching proper size before it is actually down to finished dimension. Sheffield Corp., Dept. St., Dayton 1, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Electronic Thermometer

. . . remote visual reading

This electronic thermometer operates in the range from 68 to 105° F, with temperature read directly from a large dial calibrated in both centigrade and fahrenheit. Temperature fluctuations can be



held under constant observation from a remote position, without visual error.

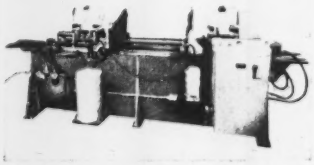
Unit is useful in such jobs as obtaining remote temperature readings of test rooms. Yellow Springs Instrument Co. Inc., Dept ST, Yellow Springs, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Double-End Machines

. . . bore, chamfer and center

Line of double-end machines is adapted to boring, chamfering, centering, burring, milling, flaring and spinning operations. Production rates in excess of 6000 pieces

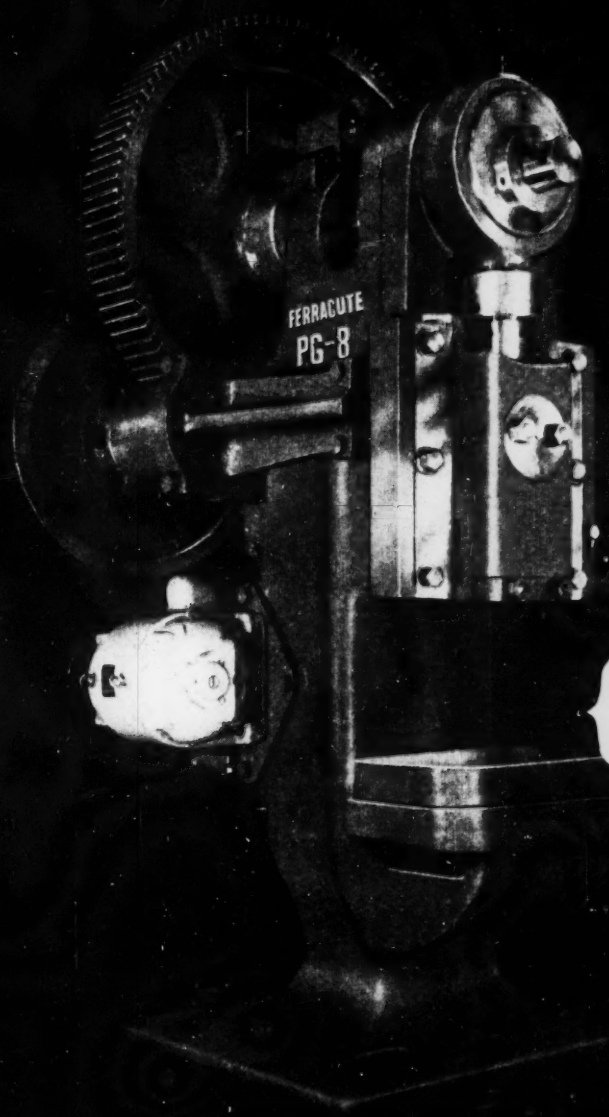


per hour are a result of hydraulic-powdered magazine feed arrangement and motorized heads equipped with hydraulic feeds.

Spindles in these heads resist unbalanced thrust loads up to 14,000 pounds. Walter P. Hill Inc., Dept. ST, 22183 Telegraph Rd., Detroit 19, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Is there a 'P' press in your plans?



FERRACUTE

PG 8—200 tons
Other sizes from 20 to 200 tons

MAKE IT A FERRACUTE!

Since 1863 Manufacturers of Power Presses & Special Machinery, FERRACUTE MACHINE CO., Bridgeton, N. J., U.S.A.

Miscellaneous parts produced from carbon steel bars on screw machines and multiple-spindle automatics

This is the last of a series of three articles relating to the selection of carbon steel bars. First dealt with economic and technical factors, while the second discussed killed and nonkilled steels.

By G. P. WITTEMAN
Assistant Metallurgical Engineer
Bethlehem Steel Co.
Bethlehem, Pa.

GUIDE FOR . . .
Selection of Carbon Steel Bars

Grade and type of bar required can be determined by product specifications. Based on use requirements, bars can be reduced to 12 general product groups

PART III

CARBON STEEL BARS may be divided into 12 product groups, which are based on use requirements.

Methods of fabrication covered by engineering data sheets in this article embrace the most common processes used to manufacture commodities from carbon steel bar products. Changing with grade and type of steel, respective methods of fabrication have certain qualitative designations—excellent, very good, good, fair and poor. Correlated with these are the designations: Annealed, special practice, and not recommended. Qualitative groups are defined below:

Excellent—superior or best
Very good—to a high degree
Good—suitable
Fair—to a certain degree
Poor—unsuitable

Here's How It Works—For specific methods of fabrication, let's look at examples from data sheets.

Group I includes this range of analysis: Carbon 0.06 to 0.13, manganese, 0.60 maximum. Grades involved are C1006, C1008, C1010, rimmed. Cold heading is excellent because of the soft rim.

These grades would be superior to C1017 or C1020 (Group II) rimmed—classed as very good—because latter grades have higher chemical composition hardness factors. Carburizing is not recommended. These steels are not produced to a controlled grain size, and chemical composition varies between rim and core.

Here's an example from Group II: Range of analysis is carbon 0.10 to 0.23, manganese 0.60 maximum; rimmed; semi-killed; killed; fine or coarse grain. Grades covered are C1012, C1015, C1017, C1020.

Upset forging is not recommended for rimmed steel due to the characteristics of the rim and core. It is fair for semi-killed steel, compared with very good for killed steel, coarse or fine grain. Here difference has to do with better homogeneity and surface of killed steel.

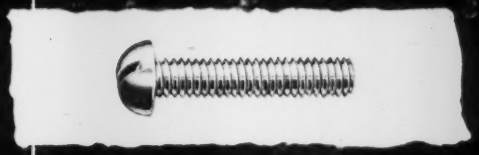
Further contrast is to be found in Group No. III, type analysis is carbon 0.13 to 0.26, manganese 0.60 to 1.00; upset forging; killed; fine grain. Quality is excellent. This is reasoned on the basis that steels in Group No. III are higher in manganese, compared with those in Group No. II. This improves homogeneity and surface.

Higher Hardness — Going to Group No. V, range of analysis is carbon 0.25 to 0.55, manganese 0.60 to 1.00; killed; coarse or fine grain. Grades included are C1029 through C1050. For cold heading, these steels must be annealed, due to the higher chemical composition hardness factor. For the same reason, these steels should be welded with special practice. This requires, depending upon the carbon and manganese contents, preheating and/or stress relieving. It also may be noted that punching is only fair.

Here's a final example from Group 8 where the range of analysis is carbon 0.13 maximum, manganese 0.60 to 1.00. Grades covered are B11xx and C12xx, nonkilled.

Outstanding feature of these steels is their excellent machinability. Owing to chemical compositions and other characteristics, they are not recommended for cold working, although there are instances where such operations are being successfully performed. Same thing is true for carburizing. Welding, due to the high sulphur contents, requires special practice, particularly in the use of welding rods which must be properly coated.

Editor's note: Caption on p. 106 of the first installment of this article, which appeared Sept. 11, should have read: Hotbed, where bars are uniformly cooled after leaving the finishing stand.



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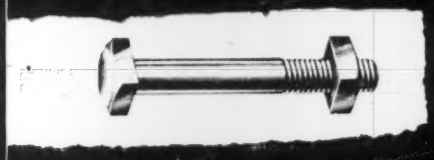
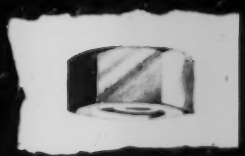
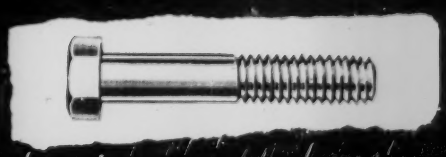
over

35 years







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ENGINEERING DATA SHEETS FOR SELECTING CARBON STEEL BARS

GROUP I

GRADES	PROPERTY	RIMMED	SEMI-KILLED	KILLED	
		Yes	No	Coarse Grain—No	Fine Grain—No
C-1006	Cold Working				
C-1008	Bending	180° Flat			
C-1010	Blanking	Very Good			
	Deep Drawing	Excellent			
	Forming	Excellent			
	Heading	Excellent			
	Punching	Good			
RANGE	Hot Working				
C MN	Drop or Flat Forging	Not Recommended			
0.06/.13 .60 max.	Upset Forging	Not Recommended			
	Welding	Excellent			
	Machining	Poor			
	Heat Treating	Not Recommended			
	Carburizing	Not Recommended			

GROUP II

GRADES	PROPERTY	RIMMED	SEMI-KILLED	KILLED	
		Yes	Yes	Coarse Grain—Yes	Fine Grain—Yes
C-1012 C-1017	Cold Working				
C-1015 C-1020	Bending	180° Over Radius 1 × Thickness			
	Blanking	Excellent	Excellent	Excellent	Excellent
	Deep Drawing	Annealed	Annealed	Annealed	Annealed
	Forming	Very Good	Very Good*	Very Good*	Good*
	Heading	Very Good	Very Good	Very Good	Very Good
	Punching	Good	Good	Fair	Fair
RANGE	Hot Working				
C MN	Drop or Flat Forging	Fair	Fair	Very Good	Very Good
0.10/.23 .60 max.	Upset Forging	Not Recommended	Fair	Very Good	Very Good
	Welding	Excellent	Excellent	Excellent	Excellent
	Machining	Poor	Poor	Poor	Poor
	Heat Treating	Not Recommended	Not Recommended	Not Recommended	Not Recommended
	Carburizing	Not Recommended	Not Recommended	Good	Fair

APPLICABLE ASTM SPECIFICATIONS:
A-7 Structural—Bridges & Buildings
A-31 Boiler Rivet Steel & Rivets
A-113 Structural—Locomotives & Cars
A-131 Structural—Ships
A-141 Structural—Rivets
A-236 Forgings—Locomotive & Cars

GROUP III

GRADES	PROPERTY	RIMMED	SEMI-KILLED	KILLED	
		Not Recommended	Yes	Coarse Grain—Yes	Fine Grain—Yes
C-1016 C-1022	Cold Working				
C-1018 C-1026	Bending		180° Over Radius 2 × Thickness		
C-1021	Blanking		Very Good	Very Good	Very Good
	Deep Drawing		Annealed	Annealed	Annealed
	Forming		Good*	Good*	Good*
	Heading		Fair	Fair	Fair
	Punching		Very Good	Very Good	Very Good
RANGE	Hot Working				
C MN	Drop or Flat Forging		Good	Very Good	Excellent
0.13/.28 0.60/1.00	Upset Forging		Good	Very Good	Excellent
	Welding		Good	Fair	Fair
	Machining		Fair	Good	Fair
	Heat Treating		Not Recommended	Fair	Fair
	Carburizing		Not Recommended	Excellent	Very Good

GROUP IV

GRADES	PROPERTY	RIMMED	SEMI-KILLED	KILLED	
		Not Recommended	Yes	Coarse Grain—Yes	Fine Grain—Yes
C-1023	Cold Working				
C-1025	Bending		180° Over Radius 2 × Thickness		
C-1031	Blanking		Good	Good	Good
	Deep Drawing		Annealed	Annealed	Annealed
	Forming		Good*	Good*	Good*
	Heading		Good	Good	Good
	Punching		Very Good	Very Good	Very Good
RANGE	Hot Working				
C MN	Drop or Flat Forging		Fair	Very Good	Very Good
0.20/.34 0.60 max.	Upset Forging		Fair	Very Good	Very Good
	Welding		Good	Good	Good
	Machining		Fair	Fair	Fair
	Heat Treating		Not Recommended	Not Recommended	Not Recommended
	Carburizing		Not Recommended	Good	Fair

APPLICABLE ASTM SPECIFICATIONS:
A-7 Structural—Bridges & Buildings
A-105 Pipe Flanges & Fittings
A-113 Structural—Locomotives & Cars
A-131 Structural—Ships
A-181 Pipe Flanges & Fittings
A-235 Forgings—General Industrial Use
A-236 Forgings—Locomotives & Cars

*Across Grain Only †Depending on Section and Analysis ‡Compare with C11xx Grades

GROUP V

GRADES		PROPERTY	RIMMED	SEMI-KILLED	KILLED	
			No	Not Recommended	Coarse Grain—Yes	Fine Grain—Yes
C-1029	C-1040	Cold Working				
C-1030	C-1042	Bending			Annealed	Annealed
C-1032	C-1043	Blanking			Fair†	Fair†
C-1035	C-1045	Deep Drawing			Not Recommended	Not Recommended
C-1037	C-1046	Forming			Annealed	Annealed
C-1038	C-1049	Heading			Annealed	Annealed
C-1039	C-1050	Punching			Fair	Fair
RANGE		Hot Working				
C	MN	Drop or Flat Forging			Very Good	Excellent
0.25/.55	0.60/1.00	Upset Forging			Good	Excellent
		Welding			Special Practice	Special Practice
		Machining			Good	Fair
		Heat Treating			Excellent	Very Good
		Carburizing			Not Recommended	Not Recommended

APPLICABLE ASTM SPECIFICATIONS: A-235 Forgings—General Industrial use. A-236 Forgings—Locomotives & Cars.

GROUP VI

GRADES		PROPERTY	RIMMED	SEMI-KILLED	KILLED	
			No	Not Recommended	Coarse Grain—Yes	Fine Grain—Yes
C-1055	C-1080	Cold Working				
C-1060	C-1084	Bending			Not Recommended	Not Recommended
C-1070	C-1085	Blanking			Annealed	Annealed
		Deep Drawing			Not Recommended	Not Recommended
		Forming			Not Recommended	Not Recommended
		Heading			Not Recommended	Not Recommended
		Punching			Fair†	Fair†
RANGE		Hot Working				
C	MN	Drop or Flat Forging			Very Good	Excellent
0.50/1.00	0.60/1.00	Upset Forging			Good	Excellent
		Welding			Special Practice	Special Practice
		Machining			Annealed	Annealed
		Heat Treating			Excellent	Excellent
		Carburizing			Not Recommended	Not Recommended

GROUP VII

GRADES		PROPERTY	RIMMED	SEMI-KILLED	KILLED	
			No	No	Coarse Grain Not Recommended	Fine Grain—Yes
C-1078	Tool Grade	Cold Working				
C-1095	Spring Grade	Bending				Not Recommended
		Blanking				Not Recommended
		Deep Drawing				Not Recommended
		Forming				Not Recommended
		Heading				Annealed
		Punching				Fair (Light Sections Only)
RANGE		Hot Working				
C	MN	Drop or Flat Forging				Excellent
0.72/1.03	0.60 max.	Upset Forging				Excellent
		Welding				Special Practice
		Machining				Annealed
		Heat Treating				Excellent
		Carburizing				Not Recommended

GROUP VIII

GRADES		PROPERTY	RIMMED	SEMI-KILLED	KILLED	
			No	Yes	Coarse Grain—No	Fine Grain—No
	S	Cold Working				
B-1111	.15 max	Bending		Not Recommended		
C-1211	.15 max	Blanking		Not Recommended		
B-1112	.23 max	Deep Drawing		Not Recommended		
C-1212	.23 max	Forming		Not Recommended		
B-113	.33 max	Heading		Not Recommended		
C-1213	.33 max	Punching		Not Recommended		
RANGE		Hot Working				
C	MN	Drop or Flat Forging		Fair		
13 max	.60/1.00	Upset Forging		Not Recommended		
		Welding		Special Practice		
		Machining		Excellent		
		Heat Treating		Not Recommended		
		Carburizing		Not Recommended		

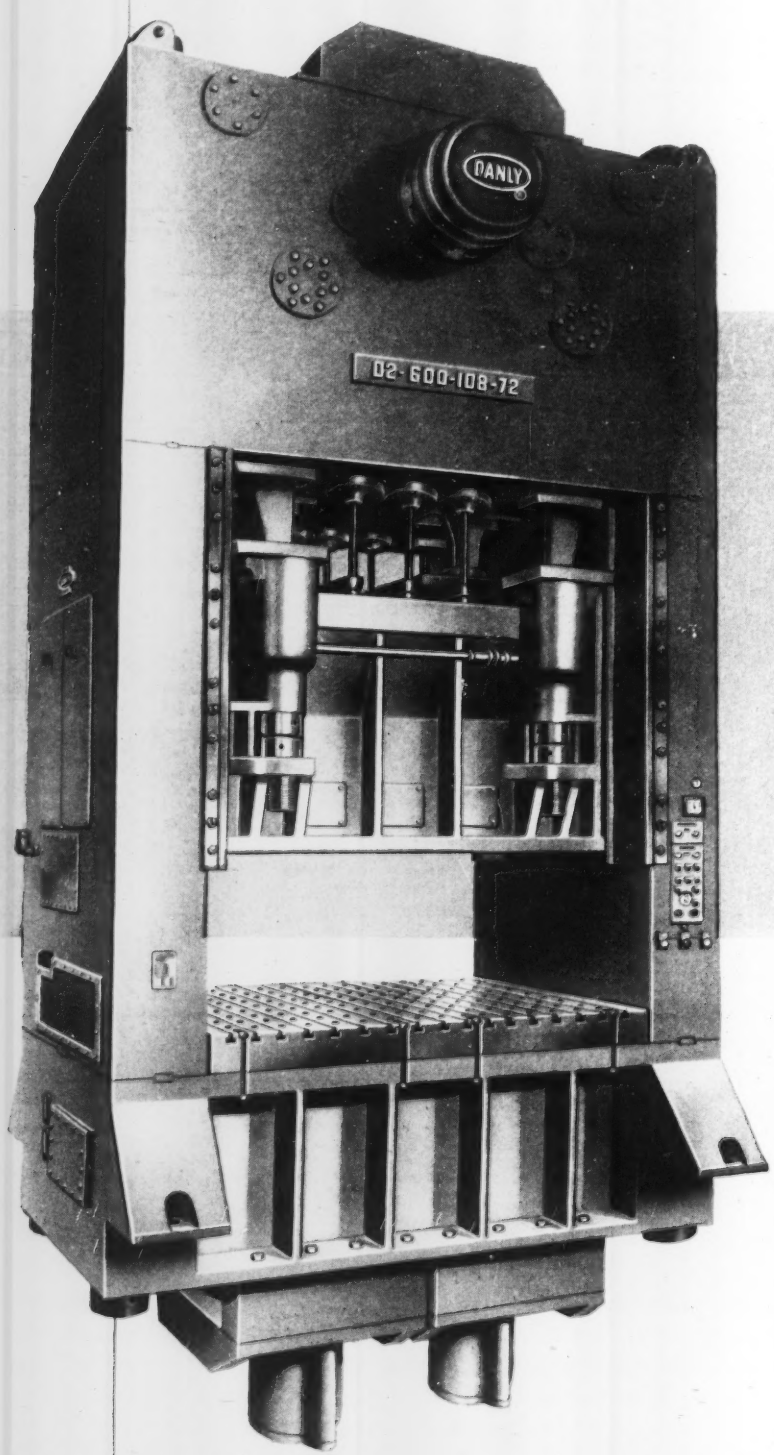
*Across Grain Only. †Depending on Section and Analysis. ‡Compare with C11xx Grades.

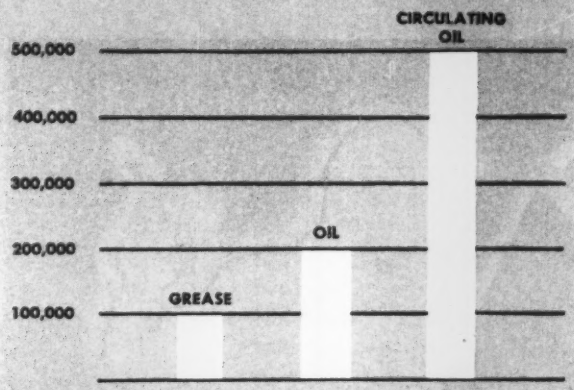
Continued on p. 113

check your maintenance records!

DANLY

SAFEGUARDED BY AUTOMATIC OIL LUBRICATION
View of 600-ton Danly Double Action Press featuring automatic *oil* lubrication to all wear points. Pressure system permits automatic safeguards against lubrication failure.





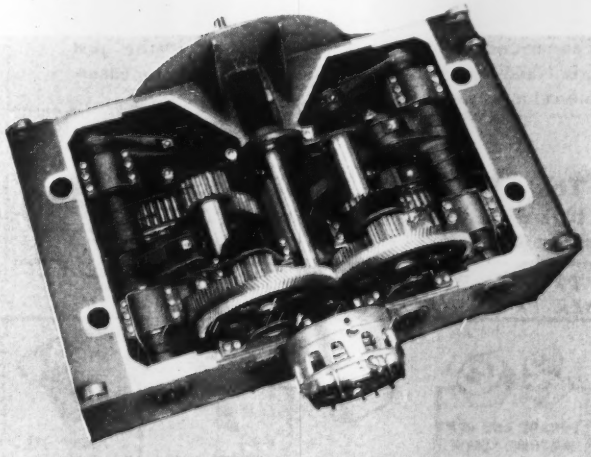
CIRCULATING OIL GIVES GREATER PROTECTION

Chart showing superiority of circulating oil lubrication for anti-friction bearings. Values at left represent bore of bearing in millimeters multiplied by speed in rpm . . . an accepted method for expressing limits of efficient bearing operation.

PRESSES

Actual day by day maintenance records in some of the country's biggest plants prove the importance of bearings in over-all press maintenance cost. The same records prove the cost advantages of Danly's automatic *circulating oil* lubrication system. Bearings wear longer because they run cooler and cleaner, continuously supplied with the proper amount of filtered oil lubrication.

Routine maintenance is reduced because periodic oiling or greasing is eliminated. The hazard of lubrication failure due to neglect or breakdown is eliminated by automatic safeguards. For the best in presses, come to DANLY.



CIRCULATING OIL TO ALL ANTI-FRICTION BEARINGS

Danly first and second intermediate shaft and drive shaft bearings, indicated in color in this exposed crown view are all anti-friction type, lubricated by filtered circulating oil. Cooler, cleaner operation prolongs life.

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MECHANICAL PRESSES . . . 50 to 3000 TONS
HYDRAULIC METALWORKING EQUIPMENT

For complete details on outstanding Danly Press features . . . construction, drive, lubrication or operation . . . send for the Double Action Press Catalog today! Danly engineers are at your service.

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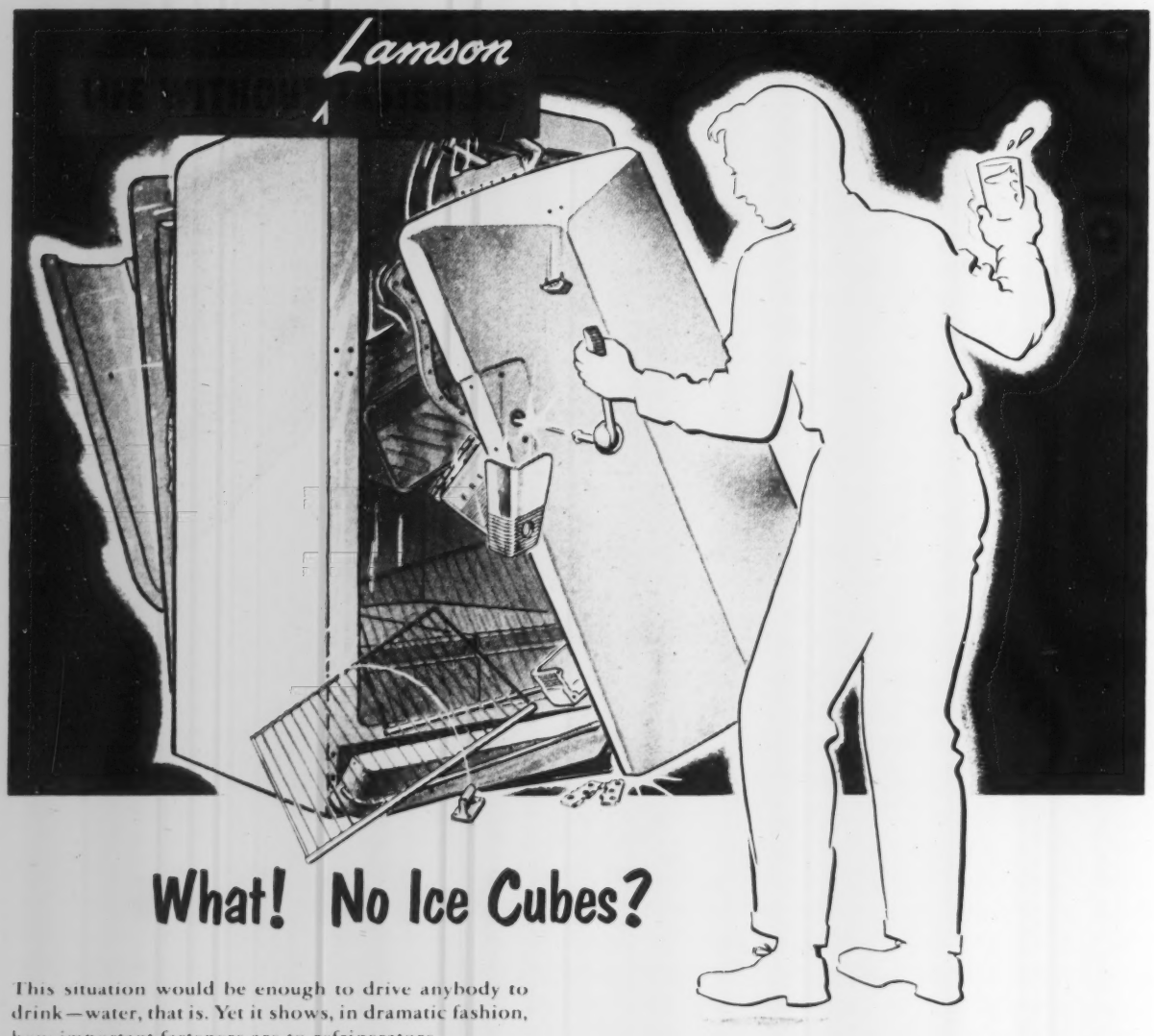
It costs less to run a DANLY PRESS!



What! No Ice Cubes?

This situation would be enough to drive anybody to drink—water, that is. Yet it shows, in dramatic fashion, how important fasteners are to refrigerators.

Of course, this will never really happen to any modern refrigerator, thanks to the constant fastener research carried on by Lamson & Sessions in cooperation with leading appliance manufacturers.

But there *is* a moral to this story: When you select fasteners for any product, it will pay you to consult Lamson *first*. If the answer isn't already in our files, our years of experience in helping manufacturers select the "just right" fastener for their products, can be of immeasurable value to you.

Lamson & Sessions

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MACHINE SCREWS
Precision made for fast, economical assembly.

PLUG NUTS
Ideal for blind or hard-to-reach places.

TAPPING SCREWS
Choice of round, pan, truss, flat oval hexagon and Phillips heads.

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"1035" Hi-Tensile Heat-treated steel.

SQUARE AND HEX MACHINE SCREW NUTS
Semi-finished, hot pressed, cold punched.

LOCK NUTS
Economical, vibration proof. Can be used repeatedly.

COTTER PINS
Steel, brass, aluminum and stainless steel.

"1035" SET SCREWS
Cup point type, hardened and heat-treated.

GROUP IX

GRADES	PROPERTY	RIMMED No	SEMI-KILLED Yes	KILLED Coarse Grain—Yes	KILLED Fine Grain—Yes
C-1108 S.08/.13 C-1109 S.08/.13 C-1115 S.08/.13 C-1125 S.08/.13 C-1126 S.08/.13	Cold Working				
	Bending		180° Over Radius 3 × Thickness		
	Blanking		Good	Good	Good
	Deep Drawing		Not Recommended	Not Recommended	Not Recommended
	Forming		Not Recommended	Not Recommended	Not Recommended
	Heading		Fair	Fair	Fair
	Punching		Good	Good	Good
RANGE C MN 08/.29 .50/1.00	Hot Working				
	Drop or Flat Forging		Fair	Fair	Good
	Upset Forging		Not Recommended	Not Recommended	Fair
	Welding		Special Practice	Special Practice	Special Practice
	Machining		Very Good‡	Good‡	Fair‡
	Heat Treating		Not Recommended	Not Recommended	Not Recommended
	Carburizing		Not Recommended	Not Recommended	Not Recommended

GROUP X

GRADES	PROPERTY	RIMMED No	SEMI-KILLED Yes	KILLED Coarse Grain—Yes	KILLED Fine Grain—Yes
C-1117 S.08/.13 C-1118 S.08/.13 C-1119 S.24/.33	Cold Working				
	Bending		180° Over Radius 3 × Thickness		
	Blanking		Good	Good	Good
	Deep Drawing		Not Recommended	Not Recommended	Not Recommended
	Forming		Not Recommended	Not Recommended	Not Recommended
	Heading		Fair	Fair	Fair
	Punching		Good	Good	Good
RANGE C MN 10/.20 1.00/1.60	Hot Working				
	Drop or Flat Forging		Fair	Fair	Good
	Upset Forging		Not Recommended	Not Recommended	Fair
	Welding		Special Practice	Special Practice	Special Practice
	Machining		Excellent‡	Very Good‡	Good‡
	Heat Treating		Not Recommended	Not Recommended	Not Recommended
	Carburizing		Good	Good	Fair

GROUP XI

GRADES	PROPERTY	RIMMED No	SEMI-KILLED No	KILLED Coarse Grain—Yes	KILLED Fine Grain—Yes
C-1140 S.08/.13 C-1145 S.04/.07 C-1146 S.08/.13	Cold Working				
	Bending			Not Recommended	Not Recommended
	Blanking			Not Recommended	Not Recommended
	Deep Drawing			Not Recommended	Not Recommended
	Forming			Not Recommended	Not Recommended
	Heading			Annealed	Annealed
	Punching			Fair†	Fair†
RANGE C MN 37/.49 .70/1.00	Hot Working				
	Drop or Flat Forging			Fair	Good
	Upset Forging			Not Recommended	Fair
	Welding			Special Practice	Special Practice
	Machining			Good‡	Fair‡
	Heat Treating			Very Good	Good
	Carburizing			Not Recommended	Not Recommended

GROUP XII

GRADES	PROPERTY	RIMMED No	SEMI-KILLED	KILLED Coarse Grain—Yes	KILLED Fine Grain—Yes
C-1137 S.08/.13 C-1141 S.08/.13 C-1144 S.24/.33	Cold Working				
	Bending			Not Recommended	Not Recommended
	Blanking			Not Recommended	Not Recommended
	Deep Drawing			Not Recommended	Not Recommended
	Forming			Not Recommended	Not Recommended
	Heading			Annealed	Annealed
	Punching			Fair†	Fair†
RANGE C MN 32/.48 1.35/1.65	Hot Working				
	Drop or Flat Forging			Fair	Good
	Upset Forging			Not Recommended	Fair
	Welding			Special Practice	Special Practice
	Machining			Very Good‡	Good‡
	Heat Treating			Excellent	Very Good
	Carburizing			Not Recommended	Not Recommended

*Across Grain Only. †Depending on Section and Analysis. ‡Compare with C11xx Grades

Extruded Steel for Planes

Lockheed experiment with complicated shapes bears fruit. Cuts 70 per cent off part cost

LOCKHEED Aircraft Corporation reports that it has developed a single-step process for extruding hot steel into complicated aircraft shapes and is now using a steel extruded part in a production model airplane.

New process, performed on a 1650-ton horizontal hydraulic press, was developed by Lockheed engineers and representatives of the Harvey Machine Works Co. under a research contract awarded to Lockheed by the Air Materiel Command of the U. S. Air Force.

Salt Bath Heat—Billets of a size suitable for extrusion are heated to approximately 2200 F in a salt bath furnace and inserted in the press container. Within a span of 2-15 seconds the white hot metal is squeezed through the die into the desired shape and the extrusion cycle is completed.

Lockheed officials disclosed that use of the new extrusion method cut 70 per cent off the cost of machine-milling an 8630 steel radome attachment bracket for a military Super Constellation.

Select Three Parts—At the outset of the development program, Lockheed engineers selected several components from three production aircraft for analysis and possible adaptability to the extrusion process.

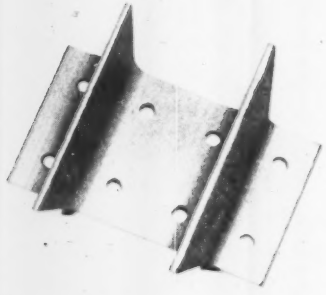
The parts chosen for study were segregated into three classes:

(1) Solid shapes usable in the extruded heat-treated state but which did not need machining (except for attachments) or cold working.

(2) Shapes requiring extrusion and additional forging, coining or cold drawing operations.

(3) Extruded steel or titanium parts of a complex nature applicable for future design.

After extensive research one part was selected from each of the three aircraft for redesign as an extrusion functionally equivalent to the original machine-milled structural component.



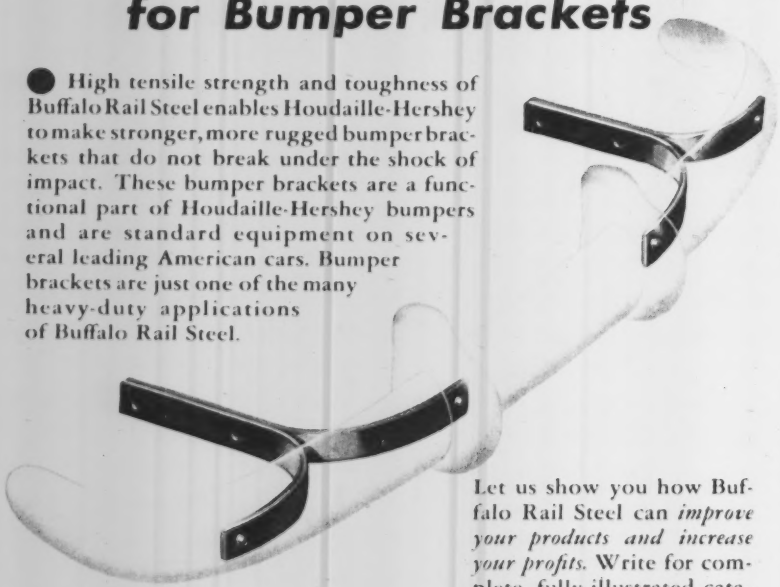
EXTRUDED STEEL BRACKET
. . . costs down 70 per cent

Start With Rounds — Development of each of the three representative applications started with rounds. Tests were then conducted to determine die design, lubricant, extrusion ratio effect on properties, optimum temperature and other factors involved in extruding.

After this preliminary phase

Houdaille-Hershey*
uses
BUFFALO STEEL
for Bumper Brackets

● High tensile strength and toughness of Buffalo Rail Steel enables Houdaille-Hershey to make stronger, more rugged bumper brackets that do not break under the shock of impact. These bumper brackets are a functional part of Houdaille-Hershey bumpers and are standard equipment on several leading American cars. Bumper brackets are just one of the many heavy-duty applications of Buffalo Rail Steel.

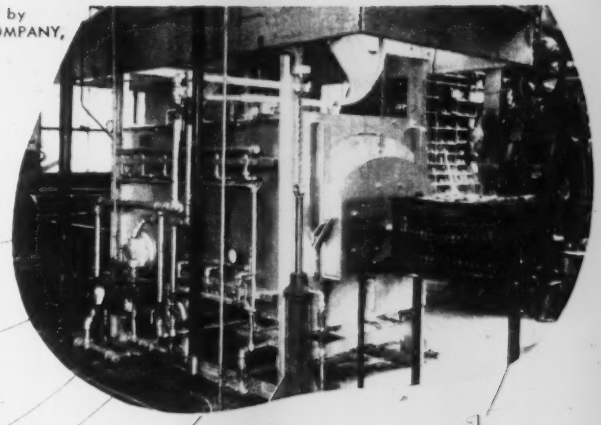


Let us show you how Buffalo Rail Steel can *improve your products and increase your profits.* Write for complete, fully illustrated catalog TODAY.

* *Houdaille-Hershey is one of America's largest independent manufacturers of Automotive and Aircraft parts.*

BUFFALO STEEL DIVISION
H. K. PORTER COMPANY, INC.
TONAWANDA, NEW YORK

Annealing furnace manufactured by
AMERICAN GAS FURNACE COMPANY,
ELIZABETH, NEW JERSEY



aluminum
brass
copper
inconel
monel
stainless

anneal them all in one versatile GAS furnace

and

1. decrease production costs
2. maintain more rigid tolerances

Annealing is only one of the many heat treating operations in which the high process efficiency of GAS is a matter of complete record.

Consider, for example, the versatility and advantages of GAS as demonstrated by C. B. Kaupp & Sons of Maplewood, New Jersey. In one single annealing furnace, using automatically controlled temperatures ranging from 750° to 2000°F, this fabricator of scientific instrument cases performs the following annealing operations

*Metal**	*Temperatures—°F*	*Time—Minutes*
Aluminum	750–1000	5 to 20
Brass & Copper	1200	20
Inconel, Monel, Stainless	1800–2000	20–30

*.015 to .125 thickness

MORE AND MORE
THE TREND IS TO GAS
FOR INDUSTRIAL PROCESSING

Results obtained more than justified the cost of the equipment and resulted in closer tolerances and better finish on the instrument cases, better productioneering practice, and longer die life.

You, too, can get similar results when you use GAS for processing. Why not consult your Gas Company?

AMERICAN GAS ASSOCIATION

420 LEXINGTON AVENUE, NEW YORK 17, NEW YORK

CONSISTENTLY good scoring, game after game, is the attribute which sets apart the championship team from the run-of-the-mine bowling quintette.

It's much the same in our game. When you select a contracting firm to undertake responsibility for your expansion program, you require an organization which consistently does quality work—quickly and economically.

The Commercial Contracting Corporation staff is proud of its qualifications and accomplishments—of the long list of clients it has served not once, but many times.

Just as any good bowling team welcomes a chance to compete, so this seasoned industrial team welcomes the opportunity to bid on any project involving one or more of the many CCC services.

CCC services, provided individually or under one PACKAGE contract, include:

• General Construction • Building Alterations • Demolition • • Foundations • Press Erecting • Machinery Moving • • Crane and Conveyor Installing • Equipment Warehousing • • Steel Fabricating • Export Packaging •

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further extrusion tests of the selected sections were conducted to establish limits of sectional shape complexity, minimum extrudable thickness effect of adjacent thick and thin section, and influence of die bearing surface and die entrance angle on flow conditions of each material.

In addition to SAE 4340 and 8630 steel alloy, 410 and 431 stainless steel alloy and Ti 150, L 2748 and RC 130B titanium alloys have been used in the extrusion development program.

Hydraulic Fluid Won't Burn

A non-flammable water base hydraulic fluid has been developed combining fire resistance with hydraulic efficiency. Known as Houghto-Safe, it is said to satisfy the need for a safe, nontoxic, non-corrosive liquid that can be used in hydraulic equipment operated near open flames or extreme heat conditions.

A water-base, "snuffer type" material introduced by E. F. Houghton & Co., Philadelphia, it has been rated as an "acceptable hydraulic fluid from the fire hazard standpoint" by the Factory Mutual Engineering Division of Associated Mutual Fire Insurance Companies.

No Freeze—In hydraulic pump tests, this fluid has shown the lubricating ability of high grade petroleum hydraulic oils. It will not freeze and is easily pumpable at working temperatures down to 0° F.

Its oxidation stability assures longer service life, and it will not attack synthetic rubber packings.

Viscosity index of the liquid is 150, indicating resistance to viscosity changes at varying temperatures. Physically, Houghto-Safe is amber colored and extremely oily in nature.

Applications include such equipment as die casting machines, hydraulic foundry equipment, coke oven door closers, hydraulic forging presses, hydraulic glass forming equipment, ingot manipulators, fork lift trucks operating near furnaces or hydraulic clamping fixtures of welding equipment, etc. In addition, the liquid will not separate or break down under increased pressures.

CALENDAR
OF MEETINGS

September 28-30, American Management Association: Personnel conference, Hotel Statler, New York. Association address: 330 W. 42nd St., New York 36. President: Lawrence A. Appley.

September 28-30, National Electronics Conference Inc.: Annual conference and exhibition, Hotel Sherman, Chicago. Conference address: 852 E. 83rd St., Chicago. Executive secretary: Karl Kramer.

September 28-October 1, Association of Iron & Steel Engineers: Annual meeting, Hotel William Penn, Pittsburgh. Association address: 1010 Empire Bldg., Pittsburgh. Managing director: T. J. Ess.

September 29-October 3, Society of Automotive Engineers Inc.: National aeronautics meeting, aircraft engineering display and aircraft production forum, Hotel Statler, Los Angeles. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

September 30-October 2, Porcelain Enamel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 1346 Connecticut Ave. NW, Washington 6. Secretary: John C. Oliver.

September 30-October 3, National Association of Aluminum Distributors: Annual meeting, Broadmoor hotel, Colorado Springs, Colo. Association address: 1900 Arch St., Philadelphia 3. Secretary: R. Bruce Wall.

October 1, American Iron & Steel Institute: Youngstown regional technical meeting, Hotel Pick-Ohio, Youngstown. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

October 5-7, American Society of Mechanical Engineers: Fall meeting, Hotel Sheraton, Rochester, N. Y. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

October 6-7, National Fluid Power Association: Fall meeting, Sheraton hotel, Chicago. Association address: 1618 Orrington Ave., Evanston, Ill. Executive secretary: Barrett Rogers.

October 6-8, American Institute of Electrical Engineers: Conference on application of motors to air-moving equipment and symposium on induction motors, Hotel Van Orman, Ft. Wayne, Ind. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

October 6-8, Electric League of Western Pennsylvania: Industrial electric exposition, William Penn hotel, Pittsburgh. Publicity chairman: F. B. Mahon, Duquesne Light Co., Pittsburgh.

October 7, National Association of Corrosion Engineers: Northeast regional conference, Hotel Taft, New Haven, Conn. Association address: 1061 M & M Bldg., Houston 2. Executive secretary: A. B. Campbell.

October 7-9, National Association of Corrosion Engineers: South-central regional meeting, Mayo hotel, Tulsa, Okla.

October 7-10, Pressed Metal Institute: Annual meeting, Bellevue-Stratford hotel, Philadelphia. Institute address: 2860 E. 130th St., Cleveland 20. Managing director: Orrin B. Werntz.

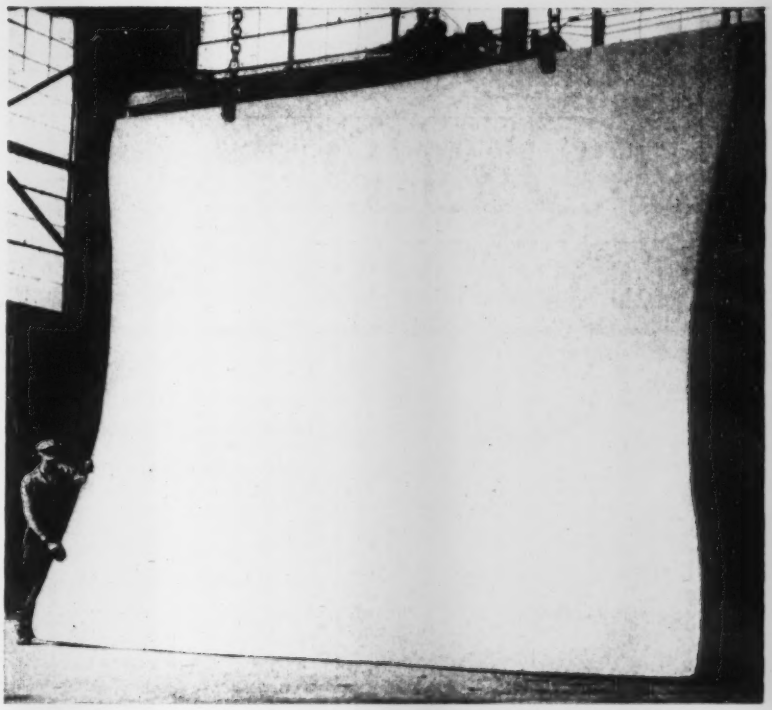
October 8, American Iron & Steel Institute: Chicago regional technical meeting, Palmer House, Chicago. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

October 8-9, Rail Steel Bar Association: Fall meeting, Hotel Sheraton, St. Louis. Association address: 38 S. Dearborn St., Chicago 3. Secretary: W. H. Jacobs.

October 8-9, American Society For Quality Control Inc.: Midwest conference, Masonic Temple, Davenport, Iowa. Society address: 70 E. 45th St., New York 17. Secretary: Edward B. Haden.

October 8-9, National Conference on Industrial Hydraulics: Sheraton hotel, Chicago. Conference secretary: John G. Duba, Illinois Institute of Technology, 35 W. 33rd St., Technology Center, Chicago 16.

October 8-9, Gray Iron Founders Society Inc.: Annual meeting, Hotel Jefferson, St. Louis. Society address: 210 National City-E. 6th St. Bldg., Cleveland. Executive vice president: Donald H. Workman.



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IT IS
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This type 304 Stainless Steel plate measures 203" x 168" x 1/2". It is to be pattern cut to customer specification. Accuracy in cutting plates of this (or any) size is the result of a unique Carlson combination . . . skilled employees and specialized equipment.

Produced to chemical industry standards of quality, this plate, weighing 5,130 lbs., is a typical example of the ability of G. O. Carlson, Inc. to meet your needs in a wide variety of stainless analyses.

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Stainless Steels Exclusively

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IN TANKS—those rumbling, roaring monarchs of our Ground Forces—vital points are protected with armor castings made by Lebanon Steel Foundry. For the Detroit Arsenal alone, Lebanon has produced over 60,000 armor castings—principally ventilating grille louvre doors and corner hull brackets for the M46, M47 and the current M48 medium (General Patton) tanks.

As early as 1935, Lebanon Steel Foundry cooperated with Army Ordnance in the development of cast armor. In 1952 Lebanon received a citation for designing and casting top-quality louvre doors for the medium tank. The engineering and production skills of Lebanon craftsmen have ably contributed to practically every tank development and production program since cast armor became a reality.

See—STEEL WITH A THOUSAND QUALITIES—37 min., 16 mm, semi-technical, full-color, sound film on the making of steel castings. For information write: Dept. B, Lebanon Steel Foundry.

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LEBANON STEEL FOUNDRY LEBANON, PA.

October 11-15, Chamber of Commerce of the United States: Better business relations conference. Hotel Gearhart, Gearhart, Oreg. Chamber of Commerce address: 1615 H. St. N.W. Washington.

October 12-13, American Coke & Coal Chemicals Institute: Annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Institute address: 711-14th St. NW, Washington 5. Executive secretary: Samuel Weiss.

October 12-14, Packaging Institute: Annual meeting. Hotel Statler, New York. Institute address: 342 Madison Ave., New York 17. Executive director: Lawrence V. Burton.

October 12-14, National Association of Sheet Metal Distributors and American Hardware Manufacturers Association: Joint convention. Marlborough-Blenheim hotel, Atlantic City. Information: Thomas A. Fernley Jr., 1900 Arch St., Philadelphia 3.

October 12-17, Concrete Reinforcing Steel Institute: Semi-annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

October 13, Steel Joist Institute: Semi-annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Institute address: Dupont Circle Bldg., Washington 6. Managing director: C. H. Luedeman.

October 13-15, Caster & Floor Truck Manufacturers Association: Annual meeting. Hotel Cleveland, Cleveland. Association address: 27 E. Monroe, Chicago 3. Executive secretary: Harry P. Dolan.

October 14-16, American Institute of Electrical Engineers: Conference on machine tools. Hotel Cleveland, Cleveland. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

October 15-17, Foundry Equipment Manufacturers Association: Annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Association address: 1008 Engineers Bldg., Cleveland 14. Assistant treasurer: Arthur J. Tuscany Jr.

October 16, American Supply & Machinery Manufacturers' Association Inc. and National Industrial Distributors' Association: Joint regional meeting and workshop conference. Statler hotel, Washington. Information: R. Kennedy Hanson, 814 Clark Bldg., Pittsburgh 22.

October 16-18, Society of Industrial Designers: Annual design conference. Bedford Springs hotel, Bedford, Pa. Society address: 48 E. 19th St., New York 17. Executive secretary: Sally G. Swing.

October 16-18, Metal Treating Institute: Annual meeting. Hotel Carter, Cleveland. Institute address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

October 17-18, American Society for Metals: Annual seminar. Hotel Statler, Cleveland. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

October 17-20, Conveyor Equipment Manufacturers Association: Annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Association address: 1 Thomas Circle, Washington 5. Executive vice president: R. C. Sollenberger.

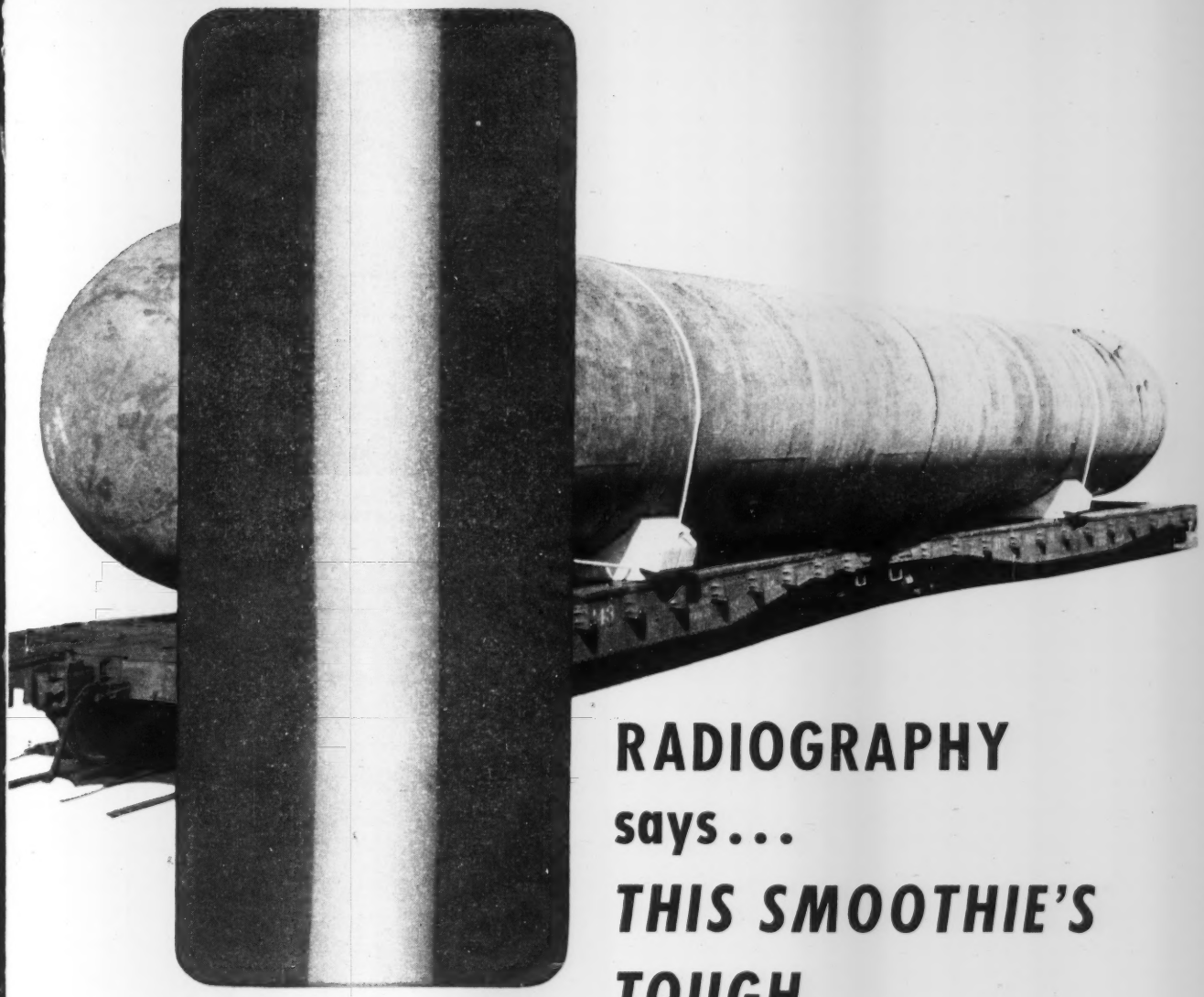
October 18-22, Chamber of Commerce of the United States: Explaining your business seminar. Broadmoor hotel, Colorado Springs, Colo. Chamber of Commerce address: 1615 H St. NW, Washington.

October 18-22, National Screw Machine Products Association: Fall meeting. Edgewater Gulf hotel, Edgewater Park, Miss. Association address: 2860 E. 130th St., Cleveland 20. Executive secretary: Orrin B. Werntz.

October 19-21, American Standards Association: Annual meeting. Waldorf-Astoria hotel, New York. Association address: 70 E. 45th St., New York 17. Secretary: Vice Adm. G. F. Hussey Jr., USN (Ret.).

October 19-23, American Society of Civil Engineers: Annual meeting. Statler hotel, New York. Society address: 33 W. 39th St., New York 18. Executive secretary: Col. William N. Carey.

October 19-23, National Metal Congress & Exposition: Public auditorium, Cleveland. Information: W. H. Eisenmann, secretary, American Society for Metals, 7301 Euclid Ave., Cleveland 3.



RADIOGRAPHY says... *THIS SMOOTHIE'S TOUGH*

This 90-ft. pressure vessel looks smooth, clean, and neat. But that's not all that welding did for it. It helped make the tank strong and tough with less weight and at lower cost.

Designers of pressure vessels can take full advantage of the welding process because each weld can be proved sound by radiography.

This is how radiography widens the opportunities for welders—why it can increase your business.

Wouldn't you like to know more about how it can help you? Get in touch with your x-ray dealer and talk it over.

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, New York

Radiography . . .
another important function of photography

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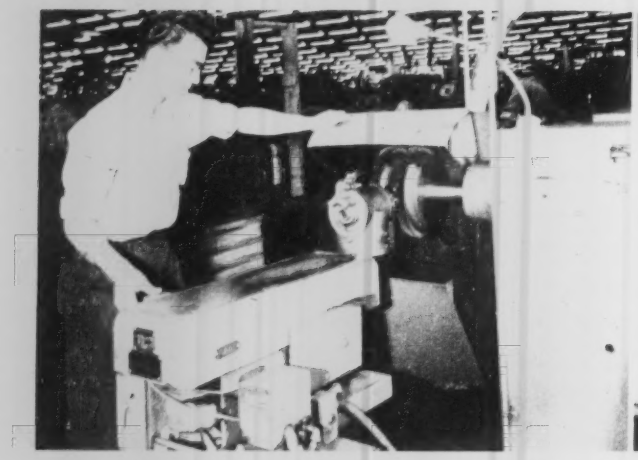
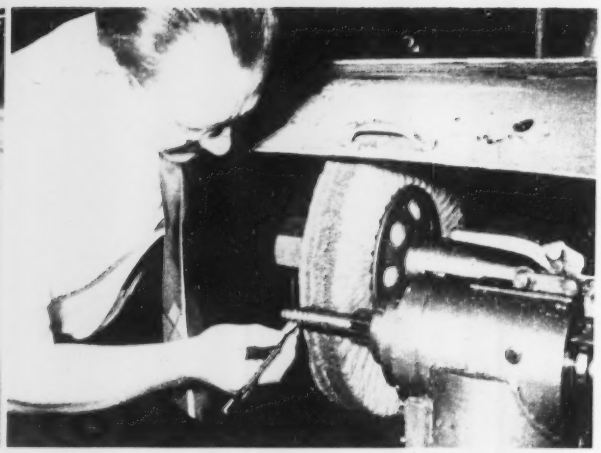


Operator's job consists only of placing gear on holder and pressing button. Holder rotates gear, then presents it to the brush. Amount of brushing each gear receives depends on the type of gear, metal and surface desired



Changeover and setup time are minimized by universal adjustment built into brushing lathe. Gear is mounted on universal head whose axis can be set in any direction. Setup is for burring and polishing square thread

Gear Deburring . . .

BRUSH SETUP MATCHES PRODUCTION PACE

When gear-cutting technique outdistanced deburring capacity, older methods had to go. Yale's machine now is adapted to 129 different parts

By WILLIAM J. MAUND
Tool Engineer
Yale & Towne Mfg. Co
Philadelphia

BRUSH DEBURRING gears has been developed into a mass production method that saves Yale & Towne Mfg. Co. more than 1000 hours a year on 17 parts alone.

Setup employs a brushing machine made by Osborn Mfg. Co., Cleveland, adapted to particular problems facing Yale & Towne. Sharp edges and burrs from gears of all shapes and sizes are removed with results that can be called outstanding. Extent of this versatility is shown clearly by production increases, plus improved quality, on 129 different gears, pinions, ratchets, etc.

Shift in Emphasis—Previously, emphasis was placed on development of gear cutting equipment until gears could be cut rapidly and with great accuracy. During this time, standard procedures were retained for removing burrs, sharp edges and other unwanted surface irregularities.

Some were hand filed; others rotary filed, then wire brushed by hand. Still others were heat-treated and burred with a piece of grinding wheel held against the face. These methods were not only slow, but they sometimes resulted in gear teeth working surfaces being nicked and led to another burring operation to remove the nicks.

With demand for quality production and pressure for higher quality at lower cost, investigation of other methods was mandatory. Present installation, evolving out of this investigation, is operated easily. A worker can attain high-quality output quickly, since his job is reduced to placing the gear on a holder and pressing a button. Once this is done, he's through until the part is brushed.

In operation, the holder rotates the gear and presents it to the brush. Preset timer controls length of cycle and retracts the holder. Amount of brushing each gear receives depends on degree of burr, metal and surface desired.

Development — Considerable experimentation established that wheel spacing, time cycle, size of wire in brushes, pressure and workpiece position are the main factors in producing satifactory results in desired time. Gears used in experimental brushing were SAE X 1314, 8-inch diametral pitch, 20-degree pressure angle, 8.750 pitch diameter, 8.875 OD.

Nine experimental setups were completed, starting with wire brush size at 0.0118-inch, time cycle at 24 seconds, pressure set at 3 amp and brush spacing $7\frac{1}{2}$ inches. Only change made in brush size was a shift to 0.014-inch, which proved to be the superior size. Time cycle was varied from 24 to 28 seconds, back to 15, then to 10 and finally all the way to 2 minutes. The latter is excessive and admittedly im-

practical, but was run to find out what would be the effect of a longer cycle. It served to prove that excess pressure and not time produces a wavy surface, since this gear had a fairly smooth surface in spite of the long contact, and pressure was held to the moderately low setting of $3\frac{1}{2}$ amp. Cycle adopted was 24 seconds.

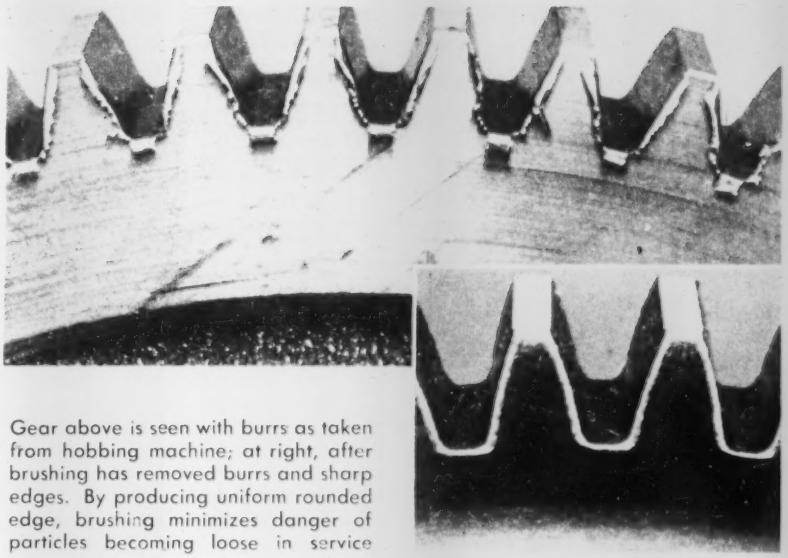
Pressure, Spacing — Pressure measured in amperage, started at 3 amp, was boosted successively to $3\frac{1}{2}$, 6 and $6\frac{1}{2}$. Result of any pressure adjustment over 3 amp was wavy lines on teeth and small burr on root. It is always evident when excessive pressure is employed because wires on the brush bend over, causing sides of the wire instead of brush ends to rub.

Two brush spacings, $7\frac{1}{2}$ and $6\frac{1}{2}$ inches, were tried. Invariably, the $6\frac{1}{2}$-inch spacing was insufficient, causing burr removal from root to be incomplete. Remaining burr shows up as a slightly narrower radius in the center of the root, but is never more than 0.0015-inch high.

Proper Proportioning—Thus, the ideal setup, with all elements properly proportioned, was determined to be one that has wire brush at 0.014-inch, a time cycle of 24 seconds, pressure set at 3 amp and brush spacing of $7\frac{1}{2}$ inches. It should be noted that a limited amount of metal can be removed from the gear root. If this is exceeded, more metal than is necessary is removed from the involute curve. This additional metal removal causes unnecessary wheel wear and increases cost of brush per gear.

Most economical procedure calls for establishing about the same edge blending by wire brushes both on the root and on the involute curve. This can be accomplished by having the center (radially) of the brushes and the center line of the gears on the same plane. Root of the gear should be one-third the width of wheel thickness from the inside edge.

Brushes should run alternately clockwise and counterclockwise to maintain sharp edges on brush



Gear above is seen with burrs as taken from hobbing machine; at right, after brushing has removed burrs and sharp edges. By producing uniform rounded edge, brushing minimizes danger of particles becoming loose in service

CHART I—TIME AND RATES

Item No.	Pitch	Number Teeth	Pitch Diameter	Hours Per Hundred	Material
1	6 10	28	3.42	1.8	SAE 3140 Forging
2	8 10	11	1.425	2	SAE 3140 Forging
3	9	27	2.980	49	Malleable Iron
4	7	38	5.410	1.1	Malleable Iron
5	12	105	8.750	1.8	SAE 4615 Forging
6	1*	6	2	1.5	SAE 1020 Bar
7	8	29	3.615	6	Malleable Iron
8	16	96	6.000	1.9	SAE 1020 Forging
9	8	34	4.250	1.8	SAE 3140 Forging
10	16	78	4.875	2.	SAE 1020 Forging
11	10	70	7.000	1.9	SAE 1314 Forging
12	8	33	4.095	.6	Malleable Iron
13	12	50	4.167	1.3	SAE 3140 Forging
14	7	48	6.837	1.6	SAE 4140 Forging
15	10	67	6.700	1.7	SAE 4140 Forging
16	10	17	1.700	1.7	SAE 3140 Bar
17	10 12	66	6.600	2.2	SAE 4140 Forging

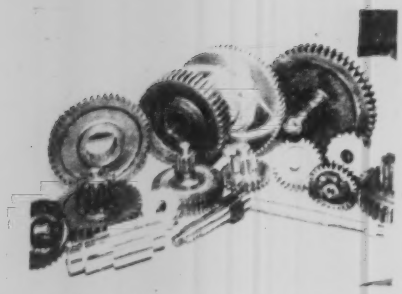
* 6 Teeth for Whitney #807 Chain 1" Pitch 9/16 diameter roller

CHART II—COMPARATIVE COSTS

Item No.	Yearly Production	Old Rate Std. Hrs. Per Hundred	New Rate Std. Hrs. Per Hundred	Hours Per Yr. Old	Hours Per Yr. New	Savings In Hours Per Year
1	15,000	4.6	2.7	690	408	282
2	20,000	3.5	2.9	704	584	120
3	14,000	2	7	280	196	84
4	7,500	3	1.6	225	121	104
5	3,180	7	2.6	224	85	139
6	6,000	3	2.3	180	121	59
7	11,000	1.3	81	143	89	54
8	3,156	4.5	2.8	139	89	50
9	4,800	2.6	2.6	124	124	0
10	1,200	6	2.9	72	35	37
11	816	8.3	2.8	66	23	43
12	4,000	1.3	81	52	32	20
13	2,196	2.3	1.9	50	42	8
14	1,056	4.3	2.3	43	23	20
15	792	4.9	2.5	39	20	19
16	864	4	2.4	36	22	14
17	264	11.2	3.1	28	8	20
Totals	95,824			3,095	2,022	1,073

Chart depicts actual hours per hundred to debur gears on the brushing lathe, with gear dimensions and material. Number of teeth: From 105-tooth gear to 6-tooth sprocket. Materials vary from malleable iron castings to SAE 4140

Comparative costs between hand burring and wire brushing on 17 parts. Standard hours are hours in time plus 20 per cent for old rates and up to 44 per cent on new rates. These are premium rates, not actual hours as in Chart I



A few of the 129 parts that are now brushed on Yale & Towne's machine

wires. Brush speed should not be less than 1600 rpm for a 12-inch diameter wheel brush.

Profitable Accounting—We now have arbors and collets completed for 129 gears, at a yearly production of 301,300 pieces. Summarizing briefly the record on only the 17 parts shown in Chart II, advantages of the mechanical setup are obvious. The various hand methods consumed 3095 hours per year. This is reduced to 2022 hours by power brushing.

If this average of 3 to 2 is assumed to hold true for all 129 parts having tools completed, it would expand to approximately 3755 the hours saved per year on all 301,300 parts. Calculated in hours consumed, the old figure shows 10,832; the new, 7077.

Setup, Changeover—Setup time runs from 12 minutes for a partial job to 24 minutes for complete changeover. Small lot parts are grouped with similar high-production units to reduce setup time to a minimum of short runs that prove to be time consuming.

A factor that helps minimize setup time is design for universal adjustment. The gear is mounted in a universal head whose axis can be set in any position. Thus, work can be presented to the brush at any angle to achieve desired brushing action.

In surfacing parts with fiber brushes and compound, power brushing becomes essentially a buffing operation. By varying type of brush and auxiliary compound used, surface finishes of 24 to 35 microinches can be refined to as little as 4 microinches.

"New Process"
Punches • Dies • Rivet Sets
Compression Riveter Dies
Made of highest standards and uniform quality thus insuring maximum service.
Since 1903
Large inventory of stock sizes of round punches and dies also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.
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Wet Blasting Dies

MANUAL POLISHING operations involved in removal of heat treat scale from parts for metal-cutting dies are reported completely eliminated by wet blasting. Sizable reductions in the amount of hand polishing required for dimensioning parts after scale removal are also experienced, because close abrasion control permits closer machining and grinding of work prior to hardening.

One job, consisting of 17 identical die inserts for a metal-cutting die, manufactured by Unified Tool Die & Mfg. Co., Chicago, had surfacing time after heat treating reduced more than 5 hours, by this process of scale removal. Die inserts are sized 1 x $1\frac{1}{2}$ x $1\frac{1}{2}$ inch. Cleaning of the punch inserts was reduced 10 hours. These 15 hours represented an 80 per cent polishing time saving.

Heat-Treating, Blasting — Both heat treating and wet blasting of the company's parts are done at Perfection Tool & Metal Heat Treating Co., Chicago. Cleaning time for die inserts in a Liquamatte machine, made by American Wheelabrator & Equipment Corp., Mishawaka, Ind., was less than 5 minutes per part. Abrasive is mechanically suspended in water by means of agitation furnished by a vertical centrifugal pump, and slurry is propelled at the work by 80 to 100 psi of compressed air.

The company says dimensioning of these inserts was made considerably easier. Entire surface of each piece is finally dimensioned from the hole in the center. Prior to this time the die maker polished scale off surfaces to get to bare metal for final dimensioning, because grinding scale sometimes produced surface cracks on hardened materials.

Exact Dimensions—The die maker was able to dimension the hole to exact size before heat treating since it is possible to maintain tolerances within 0.0001-inch where necessary. Sharp lines, corners, etc., on work remain undamaged and unaltered.

With this hole perfectly dimensioned and the whole part clean after wet blasting, it was possible to produce the necessary outside dimensions without delay.

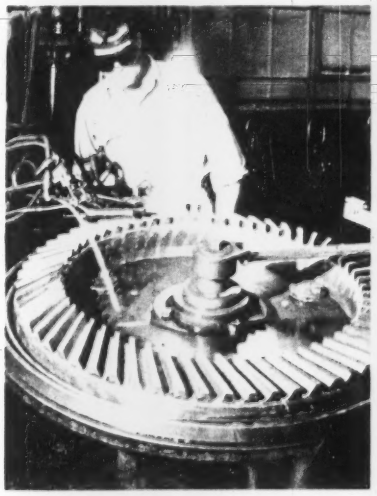
Natural Gas for Hardening

National Supply finds it a versatile tool for small-lot parts treating. Costs are way down

VERSATILITY of specialized flame hardening methods and machines that have been developed by plant engineers of the Torrance, Calif., plant of National Supply Co., permits more extensive use of natural gas for this purpose.

Comparatively small number of machines and torches have been adapted to flame harden many different parts. The large variety of parts of various shapes and sizes, and the relatively small quantity of each to process, make the most highly specialized tooling prohibitive in cost.

Little Distortion — Most parts can be finished machined and heat



HARDENING GEAR TEETH
. . . water spray follows torch

treated to the desired core properties before flame hardening because there is negligible distortion or decarburization. When dimensions are critical, a small amount of grinding stock can be left on the flame-hardened area.

Natural gas is practical for surface hardening after mixing sufficient oxygen with it to heat the surface of steel parts above the transformation temperature.

Heated part is then quenched rapidly to room temperature by water or oil. Extremely shallow depths can be hardened by a short

SHENANGO *Centrifugal* CASTINGS ... KEY TO SAVINGS

Basket centrifuge cylinders centrifugally cast in Monel Metal by Shenango. Used in superdehydrators for separating crystals given off from vacuum crystallizers.

3 REASONS WHY

SHENANGO parts give longer, more dependable Service

1 The special centrifugal casting process used by Shenango guarantees higher strength, pressure-dense castings free from sand inclusions, blowholes and other often hidden defects.

2 You specify the job and Shenango will supply the part cast in the exact metal formula for maximum service under your specific conditions.

3 Precision machining is done by skilled craftsmen in Shenango's modern machine shop. A good way to guarantee a perfect fit at minimum cost.

Send for Bulletin No. 150 covering nonferrous metal parts; Bulletin No. 151 covering Meehanite Metal, Ni-Resist and special iron alloys. *Address . . .*

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intense heat and depths of ¼-inch or more can be hardened by heating more slowly.

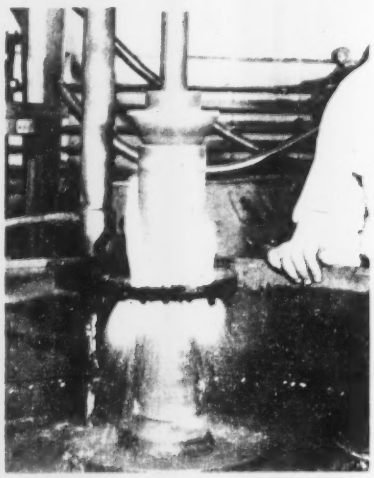
Quality Work—Spot hardening is the simplest job for a torch. This requires heating only the area to be hardened, using a hand torch, and following with direct quenching in an oil or water bath. Only areas that are not dimensionally critical can be treated in this way, since no controlling mechanism can be used and the operator depends on visual estimation of temperature and depth of heat.

Parts that are commonly flame hardened in this way include sprockets for drive groups and drawworks. These parts have relatively large teeth, move in only one direction, and therefore need to be hardened on one face of the teeth only.

Other Setups—Stationary ring torches consisting of two or more gas burners are used in hardening other parts while they are rotated at a predetermined speed. After reaching the desired temperature parts are submerged in a quenching tank for hardening.

A third method of flame hardening is by progressively moving the torch over the area to be hardened and following with a water spray quench. Many of the torches are made with a separate manifold for the water spray so that, as a segment of a surface to be hardened is heated to the desired temperature, the torch moves along the work and the spray contacts the heated area immediately afterward.

Large ring gears and pinions, which drive the rotary table of the drilling rig, and many smaller gears are hardened by this method. Large sheaves for crown and traveling blocks are hardened similarly although the sheaves are rotated slowly and the gas torch remains stationary.



FLAME RINGS SHAFT
travels top to bottom

A ring torch with a water spray attachment is used on some cylindrical parts while the part is rotated and the torch is moved from the bottom to the top of the surface being hardened. This method gives a continuous hard surface of uniform depth on either outside or inside diameters.

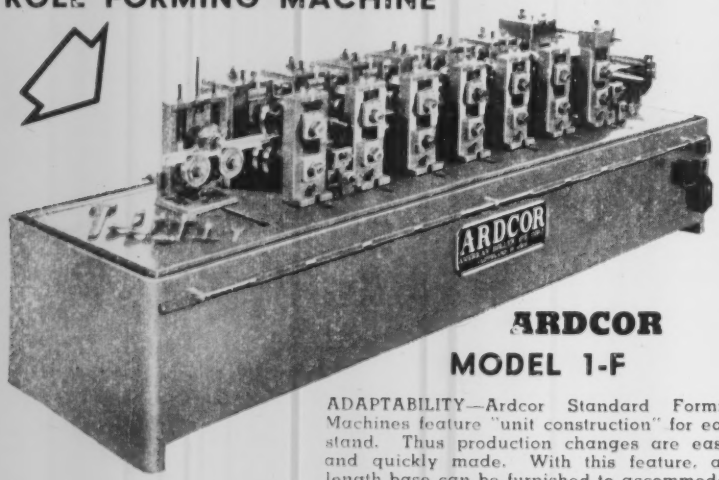
Although hardness can be checked by several methods, the Scleroscope is used because it does not damage the surface by a deep impression and the instrument does not have to be supported by a vise to apply the load. Rockwell instruments are also used, however.

ARDCOR *Engineered*

MEANS BETTER COLD-ROLL FORMING

The Production-WISE

ROLL FORMING MACHINE



ARDCOR
MODEL 1-F

Spindle Diameter	1½"
Roll Diameter	4¼" to 7"
Horizontal Distance Between Spindles	12"
Roll Space on Standard Machine	10"
Capacity Max	072

ADAPTABILITY—Ardcor Standard Forming Machines feature "unit construction" for each stand. Thus production changes are easily and quickly made. With this feature, any length base can be furnished to accommodate additional units as required.
Ardcor Roll Forming machines embody the precision, accuracy and stability found only in the highest grade machine tools. In addition, Ardcor offers a completely engineered installation — cradle reels, roll forming machines, roller dies, flying cut-off fixtures, etc. —from one qualified source.
Likely as not your special shapes can be ideally handled by a standard Ardcor machine. Your inquiry is invited—without obligation.

Also Standard Machines up to 4½" Spindle Diameter.

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Low Temperature Welding

Process repairs chips and cracks in molds without preheating. Avoids hard spots near welds

CAST IRON glass container molds that develop chips, cracks or flaws during manufacture or operation can now be repaired without preheating by applying a low temperautre welding process developed by Wall Colmonoy Corp., Detroit.

In this process, the area to be repaired is first ground to remove all oxide and provide a bright base metal surface. Then the area is heated to about 200 F with an oxy-acetylene flame.

Coat of Flux—A small amount of Colmonoy Ferrus Flux is next applied to the area and heat applied until the flux flows. In the final step, a No. 20 nickel base alloy in rod form is applied by welding using a reducing flame with a feather about twice as long as the inner cone. After the weld is completed, it is finished by grinding or filing.

EASY MOLD REPAIR
no fusion of cast iron

Use of minimum heat throughout the entire process avoids fusion of the cast iron and consequent formation of hard spots adjacent to the weld. The Colmonoy No. 20 alloy will not discolor or mark the finished glass. Since the alloy has a hardnes of from 15 to 20 Rockwell C, the welded surface can be easily smoothed by filing.

No. 20 rod contains chromium, boron and nickel and has a 2100 F melting point. It has excellent corrosion resistance, very good weldability, fair abrasion resistance and good machinability properties. It is available in 3/16 and 1/4-inch diameter bare rods.

In the welding operation the two important factors are the use of minimum heat and a minimum amount of flux.

Handling Clinic Reaches Boston

Second in the series of traveling clinics being sponsored by Material Handling Institute and American Material Handling Society is scheduled for Oct. 2 at the Sheraton Plaza hotel in Boston. AMHS New England chapter is helping arrange a group of moderators representing manufacturers and users to participate in the various handling phases to be considered. First stop in the clinic's itinerary was New York in June.

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SEAMLESS • PRESSURE • MECHANICAL
CARBON STEEL TUBES
when you specify GLOBE

SIZE RANGE — WALL THICKNESS

Globe seamless carbon steel tubes are available in a size range of 1/2 inch to 7 1/2 inches O.D.; wall thickness of .028 to 1.000 inch.

APPLICATIONS

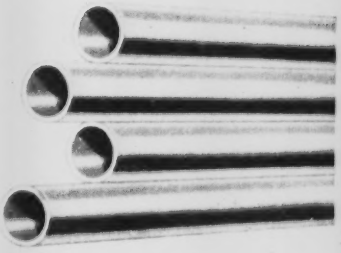
Globe Pressure Tubes are used for boilers, condensers, heat exchangers and process equipment. They meet most exacting demands of modern high pressure and high temperature installations.

Globe Mechanical Tubing (seamless) is produced by piercing solid billets. It is an ideal material for low-bearing structural members and parts where strength with minimum weight is needed. Its economy for the manufacturing of many machine parts is universally recognized.

Globe seamless carbon steel tubes are furnished to standard specifications in low and medium carbon ranges.

When you specify Globe you are sure of uniform high quality carbon steel tubes. That's because they are the product of highly developed production facilities and specialized quality controls and methods.

Globe engineers are at your service to assist in the selection of tubing of the exact characteristics you require.



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Producers of Globe seamless stainless steel — Globeweld welded stainless steel tubes — alloy-carbon seamless steel tubes — Globeiron (high purity ingot-iron) seamless tubes — Globe precision-process welding fittings.

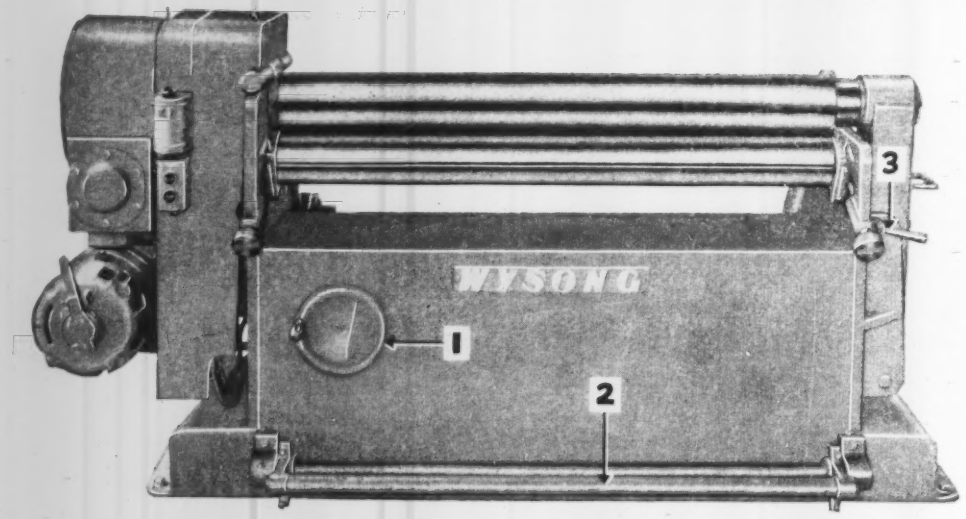
3 new features

ARE STANDARD ON WYSONG ALL-STEEL 5 INCH BENDING ROLLS

1. **Fast, parallel adjustment of rear roll with single handwheel on front of machine. Easy to read roll setting indicators are clearly visible. Saves set-up time. Saves steps.**

2. **A safety treadle extending full length of machine. Depressing the treadle from any front position immediately stops the machine. Machine is reactivated at push button station.**

3. **A single lever releases drop-end. Lowering drop-end causes top roll to lift for easy removal of finished work. In top position drop-end locks securely and provides a support for top roll.**



Wysong all-steel, 5 inch bending rolls are of the initial type. Frames are all-steel weldments. Rolls are accurately machined alloy-forgings. All rolls are power driven. Main gear drive runs in a continuous bath of oil. Drive is by V-belts. Drum control provides forward, reverse or neutral.

Optional features include: Power operated drop-end. Magnetic brake for main motor to prevent overtravel of rolls; Magnetic starter and push button control for main motor; Power adjustment for rear roll.

Made in 36" x 3/16", 48" x 8 ga., 60" x 10 ga., 72" x 12 ga., and 96" x 16 ga. sizes, Wysong all-steel 5 inch rolls are high production machines, equipped with time saving and safety features. It will pay you to compare these rolls with any other on the market before you buy. See your dealer or write to the factory for full information.

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PRECISION METAL WORKING MACHINERY

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Power Squaring Shears
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O. B. I. Presses

WYSONG AND MILES COMPANY
Greensboro, North Carolina

Buy A Wysong . . . It's Miles Ahead

STEEL
September 28, 1953

Market Outlook

STEEL production in the week ended Sept. 26 was the highest since the first week of this month, but it probably won't keep the month from being the lowest one productionwise since the steelworkers' strike a year ago last summer.

September output of steel for ingots and castings will total approximately 8.8 million net tons. Since August, 1952, the only other month in which steel output has been below 9 million tons was February of this year, when production totaled 8.9 million tons.

STILL AHEAD— Nevertheless, steel production in the first nine months of this year will be 33 per cent greater than output in 1952's comparable period which was depressed by the steelworkers' strike. This greater production is one of the reasons steel supply is overtaking demand. Not only has output been at a high rate of capacity all of this year but the capacity is at an all-time high.

THE SPUR— Upturn in steel production in the week ended Sept. 26 stems largely from settlement of a strike at the Lackawanna, N. Y., plant of Bethlehem Steel Co. National rate of production that week was 94.5 per cent, up 4.5 points over the preceding week.

NO CAUSE FOR ALARM— The decline in steel output should not be viewed with alarm, says Benjamin F. Fairless, chairman, United States Steel Corp. Operations at 100 per cent or more of capacity are unnatural. Steel plants, he explains, were never intended nor designed to operate regularly at 100 per cent of capacity.

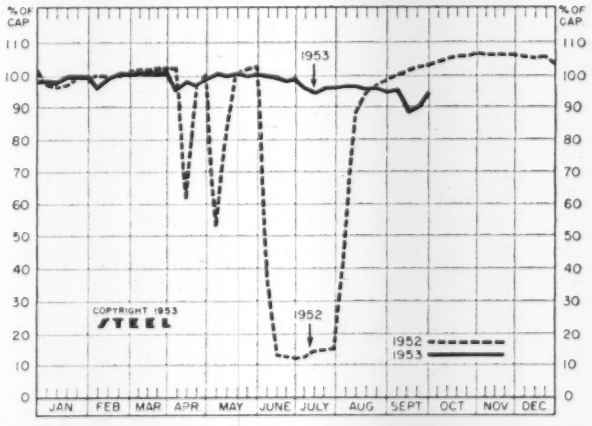
Historically, the steel industry has always had to maintain a substantial reserve of capacity for use in national emergencies. And at such times the industry is able to run at 100 per cent only by resorting to the uneconomic use of marginal facilities, materials and manpower, Mr. Fairless explains.

COMPARISONS— Even during the wartime years of 1941 to 1945, he points out, the average operating rate for the steel industry was just 94 per cent, or approximately what it is now. However, total capacity in those years was much smaller than it is today. Even if the national operating rate today were to drop as low as 81 per cent of present capacity we still would be making more steel than in the frenzied years of World War II, Mr. Fairless points out.

CHANGE OF PACE— Part of the current easing in demand for steel is a result of a washing-out of duplicate and protective buying. When buyers feared they couldn't get deliveries on schedule, they ordered more than they needed. This contributed to an inventory build-up. Now that the increase in steel capacity and the end of the Korean war have taken the pressure off the steel supply, metalworking plants are inclined to reduce their steel inventories and to trim their new orders closer to needs, both as to quantity and delivery date.

TODAY'S PICTURE— The adjustment in steel demand has put some products in plentiful supply and is carrying some others in that direction. These include some products that a few months ago were the tightest in supply. Now, the hardest to get are wide flange beams. If all of the construction that needs to be done, such as roads, bridges and school buildings, were undertaken, there would be a strong demand for steel for a long time to come.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Sept. 26	Change	Same Week 1952	Same Week 1951
Pittsburgh	94.5	— 0*	103	99.5
Chicago	99.5	— 2*	105.5	105
Mid-Atlantic	96	— 1	98	100
Youngstown	104	— 1	106	106
Wheeling	97.5	— 0.5	97.5	96.5
Cleveland	102.5	+ 1.5*	108	97
Buffalo	106.5	+ 80.5	104.5	104
Birmingham	96.5	+ 0.5	101	102
New England	85	— 2	85	93
Cincinnati	78.5	— 1	95	103
St. Louis	89	— 6	106.5	86.5
Detroit	102	+ 1	106.5	103.5
Western	103	+ 3.5	102	102
Estimated National Rate	94.5	+ 4.5	102.5	101.5

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 37 Technical Outlook—p. 85

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Sept. 22

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H. R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	5.113	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.850	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.775	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.860	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.560	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.383	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.530
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.508	Sheets, C.R., carbon	5.904	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.135	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R. alloy, high speed W18, Cr 4, V 1 (lb)	1.730	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.183				
		Strip, C.R., carbon	7.371				

‡Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Sept. 22 1953	Sept. 15 1953	Month Ago	Aug. Average
(1947-1949=100)	141.7	141.7	141.7	141.7

STEEL's FINISHED STEEL PRICE INDEX

	Sept. 24 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.38	189.38	189.38	181.31	143.08
Index in cents per lb.	5.130	5.130	5.130	4.912	3.876

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Sept. 24 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$115.56	$115.56	$115.56	$110.98	$95.05
No. 2 Fdry. Pig Iron, GT.	56.54	56.54	56.54	55.04	44.30
Basic Pig Iron, GT	56.04	56.04	56.04	54.68	43.86
Malleable Pig Iron, GT.	57.27	57.27	57.27	55.77	44.68
Steelmaking Scrap, GT.	36.50	37.50	42.17	43.00	43.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Sept. 24 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del. Philadelphia	4.38	4.38	4.38	4.13	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	3.975-4.425	3.975-4.425	3.975-4.425	3.775-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.275
Strip, C.R., Pittsburgh	5.45-5.95	5.45-5.95	5.45-5.95	5.10-5.80	4.00
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.125
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.475-5.525	5.475-5.525	5.475-5.525	5.10-5.225	4.15
Nails, Wire, Pittsburgh	6.35-6.55	6.35-6.55	6.35-6.55	6.20-6.35	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ⅜-⅝", Pitts.	4.525	4.525	4.525	4.325	3.45

PIG IRON, Gross Ton	Sept. 24 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	43.00
Basic, deld. Phila.	60.75	60.75	60.75	59.25	46.17
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	43.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	43.50
No. 2 Fdry, deld. Phila.	61.25	61.25	61.25	59.75	46.67
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.09
Malleable, Valley	56.50	56.50	56.50	55.00	43.50
Malleable, Chicago	56.50	56.50	56.50	55.00	43.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	148.00*

*78-82% Mn, per gross ton, Etna, Pa. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$39.50	$40.50	$45.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	34.50	36.50	42.50	41.50	43.50
No. 1 Heavy Melt, Chicago	33.50	33.50	39.50	42.50	41.75
No. 1 Heavy Melt, Valley	36.50	36.50	42.50	44.00	42.75
No. 1 Heavy Melt, Cleve.	32.50	33.50	41.50	43.00	42.25
No. 1 Heavy Melt, Buffalo	37.25	39.50	42.50	43.00	40.25
Rails, Rerolling, Chicago	51.00	52.00	54.50	52.50	63.25
No. 1 Cast, Chicago	35.00	35.00	41.00	48.50	70.00

COKE, Net Ton					
Beehive, Furn, Connisvl.	$14.75	$14.75	$14.75	$14.75	$14.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	17.00	17.00
Oven, Fdry, Chicago	24.50	24.50	24.50	23.00	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99% plus, ingots 21.50, pigs 20.00, 10,000 lbs or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 34.50, Lone Star brand, 35.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $2.60 per lb deld.

Cobalt: 97.99%, $2.40 per lb for 550 lb keg; $2.42 per lb for 100 lb case; $2.47 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.00-30.00 deld. Conn. Valley, 29.125-30.125 deld. Midwest; Lake 30.125 deld.; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 13.30, chemical 13.90, corroding 13.90, St. Louis. New York basis, add 0.20.

Lithium: 98%, $10-$13 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 45.00, 100 to 4999 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

DAILY NONFERROUS PRICE RECORD

	Price Sept. 24	Last Change	Previous Price	Aug. Avg.	July Avg.	Aug., 1952 Avg.
Copper	29.00-30.00	Aug. 19	28.50-30.00	29.375	29.846	24.506
Lead	13.30	Sept. 16	13.80	13.800	13.483	15.800
Zinc	10.00	Sept. 11	10.50	11.000	11.000	14.067
Tin	83.0	Sept. 24	83.75	80.530	81.577	121.500
Nickel	60.00	Jan. 14	50.50	60.000	60.000	56.500
Aluminum	21.50	July 15	20.50	21.500	20.923	19.923
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 98% plus, deld.; Magnesium, 99.8%, Freeport, Tex.

Mercury: Open market, spot, New York, $184-$186 per 76-lb flask.

Molybdenum: Powder, 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots, for addition to cast iron 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz, nom.

Palladium: $23-$24 per troy oz.

Platinum: $91-$93 per troy oz, from refineries.

Radium: $16.00-$21.50 per mg, radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $80-$85 per troy oz.

Selenium: 99.5%, $4.25-$4.75 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $42.45 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 83.50.

Tungsten Powder: 98.8%, carbon reduced, 1000 lb lots $5.35 per lb deld.; less than 1000 lb $5.50; 99% plus hydrogen reduced $6.40. Treated ingots $10.43 per lb.

Zinc: Price western 10.00, brass special 10.25, intermediate 10.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.35, special high grade 11.50, die casting alloy ingot 14.50, deld.

Zirconium: Sponge $14.00 per lb; powder 100 lb or more $7.00; less than 100 lb $8.00. (Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys 21.50-22.00; No. 12 foundry alloy (No. 2 grade) 21.00-22.00; 5% silicon alloy, 0.60 Cu max., 23.25-24.25; 13 alloy, 0.60 Cu max., 23.00-23.50; 195 alloy 22.00-23.50; 108 alloy 22.00-22.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.75-23.00; grade 2, 20.50-20.75; grade 3, 19.50-19.75; grade 4, 18.50-19.50.

Brass Ingot: Red brass, No. 115, 24.50; tin bronze, No. 225, 35.25, No. 245, 29.50; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.75; manganese bronze No. 421, 25.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 31.50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.50 per cwt; pipe, full coils $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.50-20.75.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R. ..	86.5	67.5	92.5
Strip, C.R. ...	92.5	70.5	98.5
Plate, H.R. ..	84.5	66.5	90.5
Rod, Shapes ..	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks...	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more.)

Sheets and Circles: 2S and 3S mill finish c.l.c.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., widths or diameters 24-60 in., lengths 72-240 in.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* Widths of diameters 24-48 in., lengths 72-180 in.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (In.) or distance across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.05-32.70, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 49.2 to 37.6 in. random lengths 0.375-4 in. thick, widths 0.750-10 in.

Industrial Roofing Sheet (0.032 in. thick): Flat 42.75 in. wide, lengths 60-144 in., $2.838 to $6.816 per sheet. Corrugated, 35 in. wide, lengths 60-144 in., $2.802 to $6.874 per sheet.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00; 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065 in. 87.00. Angles, 1 x 1 x ⅛ in. 72.90, 2 x 2 x ⅛ in. 67.00. Channels, 5 in. 57.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	41.68	42.26	44.63	1⅝ 500	1⅝ 000	1⅝ 000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	1⅝ 250	1⅝ 000	17.500
Commercial Bronze, 90%....	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	24.625	24.375	11.813
Phosphor Bronze, A, 5%....	66.58	67.08	67.08	68.08	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	1⅝ 2.0	1⅝ 000	17.500
Muntz Metal	43.96	39.77	....	....	1⅝ 625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 13.00; low copper clippings 10.00, mixed clippings 10.00, old sheet 9.00; borings and turnings 6.50, pistons and struts 6.50; crankcases 9.00; industrial castings 9.00.

Copper and Brass: Heavy copper and wire, No. 1 20.00, No. 2 copper 18.50-19.50, light copper 16.50; No. 1 composition red brass 15.00; No. 1 composition turnings 14.50; mixed brass turnings 9.00; new brass clippings 18.50 nom.; No. 1 brass rod turnings 13.00 nom.; light brass 9.00; heavy yellow brass 11.00; new brass rod ends 17.50 nom.; auto radiators, unsweated 11.00; cocks and faucets 13.00; brass pipe 14.50.

Lead: Heavy 9.50-10.00; battery plate 5.25-5.75; linotype and stereotype 11.75; electrotype 10.50; mixed babbitt 12.00.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 26.00-28.00; old sheet 24.00-26.00; turnings 19.00-21.00; rods 26.00-28.00.

Nickel: Sheets and clips 70.00; rolled anodes 70.00; turnings 40.00; rod ends 70.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.50; new die cast scrap, 3.50; old die cast scrap, 3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.00-15.50; 51S, 52S clippings 15.00-15.50; 14S, 17S, 24S, clippings 14.00-14.50, mixed clippings 14.00-14.50, old sheet 12.50-13.00, old cast 12.50-13.00, clean old cable, free of steel 14.50-15.50; borings and turnings 13.00-13.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 23.50 nom.; No. 2 copper 21.50-22.00; light copper 20.00-20.50; refinery brass (60% copper) per dry copper content 19.00; auto radiators 13.00 nom.

INGOT MAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 23.00-23.50; No. 2 copper 21.50; light copper 20.00; No. 1 composition borings 16.50; No. 1 composition solids 17.25; heavy yellow brass solids 13.00; yellow brass turnings 12.25; radiators 13.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $2.15 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.015; 200-499 lb $1; 500-999 lb 99.50; 1000 lb or more 99.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulfate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulfate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,900 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.500; 2500 oz and over 77.375.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1.0 premium to above.

Sodium Stannate: Less than 100 lb 66.20; 100-600 lb 52.40; 700-1900 lb 49.80; 2000-9900 lb 48.10; 10,000 lb or more 47.

Stannous Chloride (Anhydrous): Less than 50 lb $1.500; 50 to $1.164; 100-300 lb $1.019; 400-900 lb 99.40; 1000-1900 lb 97; 2000-4900 lb 93.20; 5000-15,000 lb 87.20; 20,000 lb and over 81.10.

Stannous Sulfate: Less than 50 lb $1.211; 50 lb 91.10; 100-1900 lb 85.10; 2000 lb and over 87.10.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Aluminum industry revises and expands its statistical reporting on production to conform with its growth in economic importance

THE NATION'S aluminum industry is recognizing its growing economic importance by revising and expanding its basic statistical coverage—a move long urged by industry and the business press.

Major changes, of significance to metalworking men in the more complete and broader coverage, were announced last week by the Aluminum Association in New York. New statistics are "presented in tabular form to enable us to give concisely what many of you have been requesting, more comprehensive aluminum figures," Donald M. White, association secretary, told editors.

New Listings—Primary aluminum production statistics will continue on the same basis as in previous reports. Aluminum product shipment tabulations show radical changes though. They were formerly listed in three categories: Sheet and plate, foil, permanent mold and semipermanent mold rough castings except pistons.

A glance at the accompanying table shows clearly the more extensive coverage and detailed breakdown now available. All figures are entered as net tons for convenience in making comparisons. With August compilations there will be monthly comparisons and in July, 1954, yearly comparisons will be available. Monthly production and shipment figures will be available quicker too, probably about 30 days after the month ends.

Die Castings, Too—Over-all figures will run 85 to 90 per cent of total production, but vary with each product. For example, the 2600 foundries producing aluminum sand castings present more data-gathering difficulties than the relatively few rolling aluminum sheet and plate. Die casting figures include reports supplied by American Die Casting Institute. "Included are 80 per cent of die castings shipped by job shops as die castings," says David Laine, secretary of that organization.

Tin Keeps the Lid on Price

Is tin overpriced? Look at the analysis of price changes in selected metals prepared by the Malayan Tin Bureau, informational and educational organization sponsored by the tin producing industry of Malaya, which accounts for over 35 per cent of world tin production. It shows tin has gone up only 68 per cent between July, 1939, and July, 1953, while copper has risen 195 per cent, lead 182 per cent, zinc 143 per cent and steel 101 per cent in the same period.

Shipments of Aluminum Products JULY 1953—NET TONS

Number of Companies Included:	90
Sheet and Plate	53,619
Non-heat-treatable	40,897
Heat-treatable	12,722
Foil	4,703
(Including laminations, aluminum content only)	
Extruded Products	13,148
Alloys 2S-3S-52S-61S-63S	8,632
All other alloys	4,516
Castings	12,352
Sand	1,748
Permanent Mold	5,271
Die	5,333
Tube, drawn and welded	2,383
Alloys 2S-3S-52S-61S-63S	1,804
All other alloys	578
Rod and Bar, rolled and drawn	9,277
Wire, bare, other than conductor	1,013
Electric Conductor, bare	5,033
(Aluminum content only)	
Forgings	2,224
Miscellaneous Products (Including pipe fittings, conductor accessories, impact extrusions, rivets and nails, screw machine products)	1,113

The bureau's September issue of *Tin News* also analyzes first half, 1953, world tin production and marketing. Free-world production of tin metal in the January-June period totaled 69,550 long tons, exclusive of the 18,100 long tons produced by the government-operated Texas City smelter. Stocks of tin metal outside iron-curtain countries entering 1953 were estimated at 32,657 long tons, making a total available supply during the first six months of 102,207 long tons.

U. S. industry imported 39,128 long tons. Other free countries consumed an estimated 36,451 long tons. These figures indicate that tin metal stocks outside the U. S. at midyear probably approximated 26,628 long tons, a drop of more than 18 per cent in six months. U. S. industry's stocks dipped nearly 11 per cent to 10,455 long tons at midyear. Output of tin metal and concentrates both rose sharply in July, the International Tin Study Group reports.

Higher Tariffs Debated

American Mining Congress convention in Seattle last week brought renewed agitation for and against a higher tariff on lead and zinc. Jean Vuillequez, American Metal Co. vice president, said the industry should concentrate on increasing current uses and finding new uses for lead and zinc. "They will ultimately profit more from these efforts than from any scheme which subsidizes producers or taxes the consumer of the nation at large through subsidies or hidden taxes such as tariffs," he said. The protectionist tide still isn't considered strong enough to override the strong free trade sentiment prevalent in Washington and backed by the Eisenhower administration, if not by all Republicians.

Nonferrous Briefs

•Copper fabricators' backlog dropped 23,748 tons in August, lowering backlog of orders going into September to 235,893 tons, smallest since June, 1950. Stocks of refined copper totaled 366,244 tons, and net reserves, in excess of working stocks, climbed to 103,530 tons. Another 150,000 tons of copper could be added to these net reserves without strain, according to copper men.

•Refined copper stocks in the U. S. remained steady in August, as did deliveries to fabricators, but foreign use of copper dropped 35 per cent, and refined stocks increased 44,515 tons in and outside the U. S. to a total of 288,045 tons.

•Magnesium production will probably be maintained for the rest of the year at about 6000 tons per month, says the Magnesium Association. August primary production was 6265 tons, as against 6206 tons in June. Wrought product shipments in July were 25 per cent over an abnormally low June and 12 per cent above July, 1952.

•Consistent tariff policy on strategic materials must be adopted if increased development is to be encouraged, W. Lunsford Long, president of the recently organized Tungsten Institute, told the American Mining Congress in Seattle last week.

•Secondary aluminum ingot prices are down for the second consecutive week. Decreases of up to a half-cent per pound are reported.

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civilian requirements

SLAB ZINC

PRIME WESTERN

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HIGH GRADE

SPECIAL HIGH GRADE

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STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 133. Key to footnotes, page 133.

—SEMIFINISHED—

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 ....59.00

INGOTS, Alloy (NT)
Detroit R7 ....$63.00
Fontana,Calif. K1 ....88.00
Midland,Pa. C18 ....62.00
Munhall,Pa. U5 ....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 ....$62.50
Bessemer,Pa. U5 ....62.00
Clairton,Pa. U5 ....62.00
Ensley,Ala. T2 ....62.00
Fairfield,Ala. T2 ....62.00
Fontana,Calif. K1 ....81.00
Gary,Ind. U5 ....62.00
Johnstown,Pa. B2 ....62.00
Lackawanna,N.Y. B2 ....62.00
Munhall,Pa. U5 ....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ....62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 ....75.50
Buffalo R2 ....75.50
Canton,O. R2 ....75.50
Clairton,Pa. U5 ....75.50
Cleveland R2 ....75.50
Conshohocken,Pa. A3 ....82.50
Detroit R7 ....78.50
Ensley,Ala. T2 ....75.50
Fairfield,Ala. T2 ....75.50
Fontana,Calif. K1 ....94.50
Gary,Ind. U5 ....75.50
Geneva,Utah C11 ....75.50
Houston S5 ....85.50
Johnstown,Pa. B2 ....75.50
Lackawanna,N.Y. B2 ....75.50
LosAngeles B3 ....94.50
Munhall,Pa. U5 ....75.50
Seattle B3 ....94.50
So.Chicago R2,U5,W14 ....75.50
So.Duquesne,Pa. U5 ....75.50
So.SanFrancisco B3 ....94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 ....82.00
Canton,O. R2 ....82.00
Canton,O. T7 ....84.60
Conshohocken,Pa. A3 ....89.00
Detroit R7 ....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 ....82.00
Houston S5 ....92.00
Ind Harbor,Ind. Y1 ....82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ....82.00
LosAngeles B3 ....102.00
Massillon,O. R2 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 ....82.00
So.Chicago R2,U5,W14 ....82.00
So.Duquesne,Pa. U5 ....82.00
Struthers,O. Y1 ....82.00
Warren,O. C17 ....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$92.50
Canton,O. R2 ....92.50
Cleveland R2 ....92.50
Fontana,Calif. K1 ....113.50
Gary,Ind. U5 ....92.50
Massillon,O. R2 ....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ....92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 ....3.85
Munhall,Pa. U5 ....3.75
Warren,O. R2 ....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity,Ala. R2 ....4.525
Aliquippa,Pa. J5 ....4.525
Alton,Ill. L1 ....4.70
Buffalo W12 ....4.525
Cleveland A7 ....4.525
Donora,Pa. A7 ....4.525
Fairfield,Ala. T2 ....4.525
Fontana,Calif. K1 ....5.325
Houston S5 ....4.925
Johnstown,Pa. B2 ....4.525
Joliet,Ill. A7 ....4.525
KansasCity,Mo. S5 ....4.85
LosAngeles B3 ....5.325
Minnequa,Colo. C10 ....4.775
Monessen,Pa. P7 ....4.725
No.Tonawanda,N.Y. B11 ....4.525
Pittsburg,Calif. C11 ....5.175
Portsmouth P12 ....4.525
Roebling,N.J. R5 ....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2 ....4.625
Sterling,Ill.(1) N15 ....4.525
Struthers,O. Y1 ....4.525
Torrance,Calif. C11 ....5.325
Worcester,Mass. A7 ....4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes
AlabamaCity, Ala. R2 ..4.10
Aliquippa,Pa. J5 ....4.10
Bessemer,Ala. T2 ....4.10
Bethlehem,Pa. B2 ....4.15
Clairton,Pa. U5 ....4.10
Fairfield,Ala. T2 ....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 ....4.10
Geneva,Utah C11 ....4.10
Houston S5 ....4.60
Ind Harbor,Ind. I-2 ....4.10
Johnstown,Pa. B2 ....4.15
KansasCity,Mo. S5 ....4.80
Lackawanna,N.Y. B2 ....4.15
LosAngeles B3 ....4.80
Minnequa, Colo. C10 ....4.55
Munhall,Pa. U5 ....4.10
Niles,Calif.(22) P1 ....4.91
Phoenixville,Pa. P4 ....4.95
Seattle B3 ....4.85
So.Chicago,Ill. U5, W14 ..4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 ....4.35

Wide Flange
Bethlehem,Pa. B2 ....4.15
Clairton,Pa. U5 ....4.10
Fontana,Calif. K1 ....5.30
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 ....4.10
So.Chicago,Ill. U5 ....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 ....5.00
Fontana,Calif. K1 ....6.40
Gary,Ind. U5 ....5.00
Munhall,Pa. U5 ....5.00
So.Chicago,Ill. U5 ....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ....6.175
Bessemer, Ala. T2 ....6.175
Bethlehem,Pa. B2 ....6.20
Clairton,Pa. U5 ....6.175
Fairfield,Ala. T2 ....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 ....6.175
Geneva,Utah C11 ....6.175
Ind Harbor,Ind. I-2 ....6.175
Ind Harbor,Ind. Y1 ....6.675
Johnstown,Pa. B2 ....6.20
Lackawanna,N.Y. B2 ....6.20
LosAngeles B3 ....6.85
Munhall,Pa. U5 ....6.175
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 ....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ....6.20
Lackawanna,N.Y. B2 ..6.20
Munhall,Pa. U5 ....6.125
So.Chicago,Ill. U5 ....6.125

BEARING PILES
Munhall,Pa. U5 ....4.10
So.Chicago,Ill. U5 ....4.10

—PILING—

STEEL SHEET PILING
Ind Harbor,Ind. I-2 ....4.925
Lackawanna,N.Y. B2 ..4.925
Munhall,Pa. U5 ....4.925
So.Chicago,Ill. U5 ....4.925

—PLATES—

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 ....4.10
Ashland,Ky. (15) A10 ..4.10
Bessemer,Ala. T2 ....4.10
Clairton,Pa. U5 ....4.10
Claymont,Del. C22 ....4.55
Cleveland J5 ....4.10
Coatesville,Pa. L7 ....4.35
Conshohocken,Pa. A3 ..4.55
Ecorse,Mich. G5 ....4.65
Fairfield,Ala. T2 ....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 ....4.10
Geneva,Utah C11 ....4.10
GraniteCity,Ill. G4 ....4.60
Harrisburg,Pa. C5 ....4.95
Houston S5 ....4.80
Ind Harbor,Ind. I-2, Y1 4.10
Johnstown,Pa. B2 ....4.10
Lackawanna,N.Y. B2 ..4.10
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 ....4.10
Pittsburg,Calif. C11 ....4.95
Portland,Oreg. O4 ....4.90
Seattle B3, N14 ....4.90
So.Chicago R2, U5, W14 4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3 ..4.90
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 ....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.30
Youngstown R2, U5 ....4.15

PLATES, Carbon A.R.
Fontana,Calif. K1 ....5.90
Geneva,Utah C11 ....5.25

PLATES, Wrought Iron
Economy,Pa. B14 ....9.30

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.25
Bessemer,Ala. T2 ....6.25
Clairton,Pa. U5 ....6.25
Cleveland J5 ....6.25
Conshohocken,Pa. A3 ..6.50
Ecorse,Mich. G5 ....7.40
Fairfield,Ala. T2 ....6.25
Fontana,Calif. (30) K1 ..6.95
Gary, Ind. U5 ....6.25
Geneva,Utah C11 ....6.25
Ind Harbor,Ind. I-2 ....6.25
Ind Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 ....6.25
Lackawanna,N.Y. B2 ..6.25
Munhall,Pa. U5 ....6.25
Pittsburgh J5 ....6.25
Seattle B3 ....7.15
Sharon,Pa. S3 ....6.25
So. Chicago,Ill. U5, W14 6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 ....6.25
Youngstown Y1 ....6.75

PLATES, Alloy
Claymont,Del. C22 ....5.65
Coatesville,Pa. L7 ....5.75
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 ....5.55
Johnstown,Pa. B2 ....5.55
Munhall,Pa. U5 ....5.55
Sharon,Pa. S3 ....5.70
So.Chicago,Ill. U5, W14 5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 ....5.15
Conshohocken,Pa. A3 ..5.15
Ind. Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 ....5.15
So.Chicago,Ill. U5 ....5.15

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..4.35
Ashland,l.c.l. (15) A10..4.85
Cleveland, c.l. R2 ....4.70
Warren,O. c.l. R2 ....4.70

—BARS—

BARS, Hot-Rolled Carbon
AlabamaCity, Ala. R2 ..4.15
Aliquippa,Pa. J5 ....4.15
Alton,Ill. L1 ....4.50
Atlanta,Ga. A11 ....4.40
Bessemer,Ala. T2 ....4.15
Buffalo R2 ....4.15
Canton,O. R2 ....4.15
Clairton,Pa. U5 ....4.15
Cleveland R2 ....4.15
Detroit R7 ....4.30
Ecorse,Mich. G5 ....4.50
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 ....4.15
Fontana,Calif. K1 ....4.85
Gary,Ind. U5 ....4.15
Houston S5 ....4.65
Ind Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 ....4.15
KansasCity,Mo. S5 ....4.85
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 ....4.55
Milton,Pa. B6 ....4.55
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 ....4.85
N.Tonawanda,N.Y B11 ..4.15
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 ....4.15
Portland,Oreg. O4 ....4.90
Seattle B3, N14 ....4.90
So.Chicago R2, U5, W14 4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3 ..4.90
Sterlingill.(1) N15 ....4.15
Struthers,O. Y1 ....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.30
Youngstown R2, U5 ....4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 ....4.875
Canton,O. T7 ....5.02
Canton,O. R2 ....4.875
Clairton,Pa. U5 ....4.875
Detroit R7 ....4.875
Ecorse,Mich. G5 ....5.225
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 ....4.875
Houston S5 ....5.375
Ind Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 ....4.875
KansasCity,Mo. S5 ....5.575
Lackawanna,N.Y. B2..4.875
LosAngeles B3 ....5.925
Massillon,O. R2 ....4.875
Midland,Pa. C18 ....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 ....4.875
Warren,O. C17 ....4.875
Youngstown U5 ....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.225
Bessemer,Ala. T2 ....6.225
Bethlehem,Pa. B2 ....6.225
Clairton,Pa. U5 ....6.225
Ecorse,Mich. G5 ....6.875
Fairfield,Ala. T2 ....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 ....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb., Ind. I-2 ....6.225
Johnstown,Pa. B2 ....6.225
Lackawanna,N.Y. B2 ..6.225
LosAngeles B3 ....6.925
Pittsburgh J5 ....6.225
Seattle B3 ....6.975
So.Chicago W14 ....6.225
So.Duquesne,Pa. U5 ..6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 ....6.725
Youngstown U5 ....6.225

BAR SIZE ANGLES,H.R.CARBON
Bethlehem,Pa. B2 ....4.35

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa, J5 ....4.15
Atlanta A11 ....4.40
Niles,Calif. P1 ....4.85
SanFrancisco S7 ....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ....5.00
Fontana,Calif. K1 ....6.00
Gary,Ind. U5 ....5.00
Houston S5 ....5.70
KansasCity S5 ....5.90
Youngstown U5 ....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.20
BeaverFalls,Pa. M12, R2 5.20
Buffalo B5 ....5.25
Camden,N.J. P13 ....5.65
Carnegie,Pa. C12 ....5.20
Chicago W18 ....5.20
Cleveland A7, C20 ....5.20
Detroit P17, R7 ....5.35
Detroit B5 ....5.40
Donora,Pa. A7 ....5.20
Elyria,O. W8 ....5.20
FranklinPark,Ill. N5 ....5.20
Gary,Ind. R2 ....5.20
GreenBay,Wis. F7 ....5.185
Hammond,Ind. L2, M13 5.20
Hartford,Conn. R2 ....5.75
Harvey,Ill. B5 ....5.20
LosAngeles R2 ....6.65
Mansfield,Mass. B5 ....5.75
Massillon,O. R2 ,R8 ....5.20
Monaca,Pa. S17 ....5.20
Newark,N.J. W18 ....5.65
NewCastle,Pa. (17) B4, ..5.20
Pittsburgh J5 ....5.20
Plymouth,Mich. P5 ....5.45
Putnam,Conn. W18 ....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 ....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 ....5.65
Struthers,O. Y1 ....5.20
Waukegan,Ill. A7 ....5.20
Worcester,Mass. W19 ..6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md. (5) C19..4.45

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 ....6.325
Buffalo B5 ....6.325
Camden,N.J. P13 ....6.50
Canton,O. R2 ....6.325
Canton,O. T7 ....6.29
Carnegie,Pa. C12 ....6.00
Chicago W18 ....6.325
Cleveland A7, C20 ....6.325
Detroit P7 ....6.425
Detroit P17 ....6.440
Detroit B5 ....6.525
Donora,Pa. A7 ....6.325
Elyria,O. W8 ....6.325
Gary,Ind. R2 ....6.325
Hammond,Ind. L2, M13 6.325
Hartford,Conn. R2 ....6.775
Harvey,Ill. B5 ....6.325
Lackawanna,N.Y. B2 ..6.325
Mansfield,Mass. B5 ..6.775
Massillon,O. R2, R8 ..6.325
Midland,Pa. C18 ....6.325
Monaca,Pa. S17 ....6.325
Newark,N.J. W18 ....6.65
Plymouth,Mich. P5 ..6.525
So.Chicago,Ill. R2, W14 6.325
SpringCity,Pa. K3 ....6.475
Struthers,O. Y1 ....6.325
Warren,O. C17 ....6.325
Waukegan,Ill. A7 ....6.325
Worcester,Mass. A7 ..6.625
Youngstown F3, Y1 ...6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..4.15
Atlanta A11 ....4.40
Buffalo R2 ....4.15
Cleveland R2 ....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 ....4.15
Fontana,Calif. K1 ....4.85
Gary,Ind. U5 ....4.15
Houston S5 ....4.65
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 ....4.15
KansasCity,Mo. S5 ....4.85
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 ....4.85
Milton,Pa. B6 ....4.55
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 ....4.85
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 ....4.15
SandSprings,Okla. S5 ..5.05
Seattle B3, N14 ....4.90
So.Chicago,Ill. R2 ....4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFrancisco B3 ....4.90
SparrowsPoint,Md. B2 ..4.15
Sterling,Ill. (1) N15 ....4.15
Struthers,O. Y1 ....4.15
Torrance,Calif. C11 ....4.85
Youngstown R2, U5 ....4.15

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼-1" B2 ....5.55
KansasCity S5 ....6.35
LosAngeles B3 ....6.18
Marion,O P11 ....5.55
Seattle N14 ....5.80
Seattle B3 ....6.25
So.SanFrancisco B3 ....6.25
SparrowsPt. ½-1" B2 ..5.55
Williamsport,Pa. S19 ...5.45

RAIL STEEL BARS
Avis,Pa.(4) J8 ....4.75
ChicagoHts.(3) C2 ....4.50
ChicagoHts.(4) C2 ....4.75
ChicagoHts.(3,4), I-2 ....4.50
FortWorth,Tex.(26) T4..4.65
Franklin,Pa.(3) F5 ....4.50
Franklin,Pa.(4) F5 ....4.75
Marion,O.(3) P11 ....4.50
Moline,Ill.(3) R2 ....4.50
Tonawanda(3,4) B12 ....5.00
Williamsport,Pa.(3) S19..5.25
Williamsport,Pa.(4) S19..5.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14..10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK Rks.(Staybolt) L5..15.50
McK Rks.(S.R.) L5 ...10.40
McK Rks.(D.R.) L5 ...14.00

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Ashland,Ky.(8) A10 ..3.925
Butler,Pa. A10 ....3.925
Cleveland J5 R2 ....3.925
Conshohocken,Pa. A3 ..4.05
Detroit M1 ....4.40
Ecorse,Mich. G5 ....4.125
Fairfield,Ala. T2 ....3.925
Fairless,Pa. U5 ....4.025
Fontana,Calif. K1 ....4.70
Gary,Ind. U5 ....3.925
Geneva,Utah C11 ....4.025
GraniteCity,Ill. G4 ....4.30
Ind Harbor,Ind. I-2, Y1 3.925
Irvin,Pa. U5 ....3.925
Lackawanna,N.Y. B2..3.925
Munhall,Pa. U5 ....3.925

Niles,O. N12 .....5.425
Pittsburg,Calif. C11 ..4.625
Pittsburgh J5 .....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ..3.925
Torrance,Calif. C11 ..4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown U5, Y1 ..3.925

SHEETS, H.R. (19 gage)

AlabamaCity,Ala. R2 ..5.225
Dover,O. R1 .....5.975
Mansfield,O. E6 .....5.80
Niles,O. N12 .....5.20
Torrance,Calif. C11 ..5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 ....5.90
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.375
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 .....7.00
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 ....5.90
SparrowsPoint(38) B2 ..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....6.175
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind. Harbor,Ind. I-2 ..4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala. T2 .....4.775
Fairless,Pa. U5 .....4.875
Follansbee,W.Va. F4 ..5.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2,Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2 ..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ..5.725
Pittsburgh J5 .....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.675
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1 .7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2 7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.475
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10 .....5.275
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2 ..5.275
Ashland,Ky. (8) A10 ..5.275
Canton,O. R2 .....5.275
Dover,O. R1 .....5.675
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ..5.325
Irvin,Pa. U5 .....5.275†
Kokomo,Ind.(13) C16..5.375
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.80
Pittsburg,Calif. C11 ..6.025†
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2 .8.075

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Culvert	**Cu Alloy**	**Cu Fe**
Ashland,Ky. A10	6.325	....
Canton,O. R2	...6.475	6.925
Fairfield T2	....6.075	6.325
Gary,Ind. U5	..6.075	6.325
Ind.Harbor I-2	..6.075	6.325
Irvin,Pa. U5	..6.075	6.325
Kokomo,Ind. C16	6.525	....
MartinsFry.,O.W10	6.075	....
Pitts.,Cal. C11	.6.825	....
SparrowsPt. B2	6.075	....
Torrance,Calif.C11	6.825	....

SHEETS, Culvert	**Pure Iron**
Ashland,Ky. A10	.....6.575
Fairfield,Ala. T2	.....6.325
MartinsFerry,O. W10	..6.325

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind.(13) C16 ..5.925
Niles,O. N12 .....6.35

†Based on 5c zinc

SHEETS, ZINCGRIP Steel

Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized

Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ...5.875
Ind.Harbor,Ind. I-2 ..5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.

Yorkville,O. W10 .....7.20
Follansbee,W.Va. F4 ....7.30
Follansbee (23) F4 ..7.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....5.675
Niles,O. N12 .....6.00
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.075

SHEETS, Well Casing

Fontana,Calif. K1 .....6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..3.925
Alton,Ill. L1 .....4.20
Ashland,Ky.(8) A10 ..3.925
Atlanta A11 .....4.175
Bessemer,Ala. T2 .....3.925
Bridgeport,Con.(10)S15 4.425
Buffalo (27) R2 .....3.925
Butler,Pa. (8) A10 ...3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ....4.05
Detroit M1 .....4.40
Ecorse,Mich. G5 .....4.225
Fairfield,Ala. T2 .....3.925
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.425
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.625
Lackawa'na,N.Y.(32) B2 3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. B6 .....4.35
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 ....4.425
N.Tonawanda,N.Y. B11.3.925
Pittsburg,Calif. C11 ...4.675
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. W14 ....3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2 3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....4.025
Youngstown Y1, U5 ..3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.45
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.90
KansasCity,Mo. S5 ....7.10
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.45
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 ....5.65
Conshohocken,Pa. A3 ..6.20
Ecorse,Mich. G5 .....6.50
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 .....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.40
Seattle(25) B3 .....6.65
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25)B3 .6.40
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....6.30
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...4.175
Warren,O. 4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.80
Bridgeprt,Conn.(10) S15..6.15
Butler,Pa. A10 .....5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....6.05
Detroit D2, P20 .....5.90
Detroit M1 .....5.45
Dover,O. G6 .....5.80
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ...5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill.(40) T6 .5.70
Ind.Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ..5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.45
NewBritain(10) S15 ....6.15
NewCastle,Pa.(14) B4 ..5.45
NewCastle,Pa. E5 ....5.95
NewHaven,Conn. A7 ....5.95
NewHaven,Conn. D2 ...6.20
Pawtucket,R.I. R3 ....6.80
Pawtucket,R.I.(21) N8..6.65
Riverdale,Ill. (40) A1 ..5.70
Rome,N.Y.(29) R6 ....5.45
Sharon,Pa. S3 .....5.80
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2(50) 6.40
Warren,O.(40) T5 .....5.95
Warren,O. R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) N8..12.15
Pawtucket,R.I.(12) N8..12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ..12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.50
Lackawanna,N.Y. B2 ..8.15
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. 8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.30
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.05

STRIP, Electrogalvanized

Dover,O. G6 .....5.70
Warren,O. T5 .....5.70
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.96

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.55
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co. Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur D. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest Steel Roll. Mills
N15 Northwestern S.&W Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons,John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv. EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 StainlessWeldedProducts
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West Auto Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div.,Colo.Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	6.15	8.00	8.60	10.55	12.85
Bristol,Conn. W1			8.90	10.85	
Carnegie,Pa. S18		8.00	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
DearbornMich. D3	6.05	8.25	8.85		
Detroit D2	6.45	7.85	8.45	10.55	
Dover,O. G6	6.05	8.00	8.60	10.55	12.85
FranklinPark,Ill. T6	5.80	7.80	8.75	10.70	
Harrison,N.J. C18			8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	6.15	8.00	8.60	10.55	12.85
NewCastle,Pa. B4	5.80	8.00	8.60		
NewCastle,Pa. E5	5.95	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	6.70	7.95	8.55	10.50	
NewYork W3		8.30	8.90	10.85	13.15
Pawtucket,R.I. N8; Cleve.orPitts.Base		8.00	8.60	10.55	12.85
Worcester,Mass.,Base	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3		8.00	8.60	10.55	12.85
Trenton,N.J. R5		8.30	8.90	10.85	13.15
Wallingford,Conn. W2	6.65	7.95	8.90	10.85	13.15
Warren,O. T5	6.20	8.00	8.60	10.55	12.85
Weirton,W.Va. W6	5.80	8.00	8.60	10.55	12.85
Worcester,Mass. A7	5.75	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8		8.00	8.60	10.55	12.85
Spring Steel (Tempered)					
Bristol,Conn. W1			12.50	15.00	
FranklinPark,Ill. T6			12.50	15.00	18.00
Trenton,N.J. R5			12.50	15.00	18.00
Harrison,N.J. C18			12.50	15.00	18.00
NewYork W3			12.50	15.00	18.00
Worcester,Mass. T6			12.50	15.00	18.00
Youngstown C8			12.50	15.00	18.00

SILICON STEEL

SHEETS, SILICON, H.R. or C.R. COILS (cut lengths ½c lower) (22 Ga.)	Armature Field	Armature	Electric	Motor	Dynamo
BeechBottom,W10 (cut lengths)	...	...	8.35	9.60	10.40
Brackenridge,Pa. A4	...	...	8.85	10.10	10.90
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	8.05	8.35	8.85	(24)	...
Mansfield,O. E6 (cut lengths)	7.55	7.85	8.35	9.60	10.40
Newport,Ky. N9 (cut lengths)		7.85	8.35	9.60	10.40
Niles,O. N12 (cut lengths)	7.55	7.85	8.35	...	...
Vandergrift,Pa. U5		8.35	8.85	10.10	10.90
Warren,O. R2	8.05	8.35	8.85	10.10	10.90
Zanesville,O. A10	...	8.35	8.85	10.10	10.90

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)	Transformer Grade 72	65	58	52
BeechBottom,W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa. A4	11.45	...	...	...
Newport,Ky. N9 (cut lengths)	10.95	...	...	...
Vandergrift,Pa. U5	11.45	12.00	12.70	13.50
Warren,O. R2	11.45	...	...	...
Zanesville,O. A10	11.45	12.00	12.70	13.50

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	16.05	16.55
Vandergrift,Pa. U5	14.00	14.85	15.85	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	...
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2,Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.55

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	.5.525
Aliquippa,Pa. J5	.5.525
Alton,Ill. L1	.5.75
Atlanta A11	.5.775
Bartonville,Ill. K4	.5.625
Buffalo W12	.5.525
Chicago W13	.5.525
Cleveland A7, C20	.5.525
Crawfordsville,Ind. M8	.5.625
Donora,Pa. A7	.5.525
Duluth,Minn. A7	.5.525
Fairfield,Ala. T2	.5.525
Fostoria,O. (24) S1	.5.75
Houston S5	.5.925
Johnstown,Pa. B2	.5.525
Joliet,Ill. A7	.5.525
KansasCity,Mo. S5	.6.125
Kokomo,Ind. C16	.5.625
LosAngeles B3	.6.475
Minnequa,Colo. C10	.5.775
Monessen,Pa. P7	.5.525
No.Tonawanda B11	.5.525
Palmer,Mass. W12	.5.825
Pittsburg,Calif. C11	.6.475
Portsmouth,O. P12	.5.525
Rankin,Pa. A7	.5.525
So.Chicago,Ill. R2	.5.525
So.SanFrancisco C10	.6.475
SparrowsPoint,Md. B2	.5.625
Sterling,Ill. (1) N15	.5.525
Struthers,O. Y1	.5.525
Torrance,Calif. C11	.6.475
Waukegan,Ill. A7	.5.525
Worcester,Mass. A7	.5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.15
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
Millbury,Mass. (12) N6	8.725
Minnequa,Colo. C10	7.175
Monessen,Pa. P7	6.925
Monessen,Pa. P16	6.95
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.85
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.875
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Torrance,Calif. C11	7.575
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving (8" Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Johnstown,Pa. B2	9.50
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4 T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.00
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P16	8.00
Monessen,Pa., P7	7.45
Pawtkt.R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld.	Galv.
AlabamaCity R2	6.675	7.075
Aliquippa J5	6.675	7.20*
Atlanta A11	6.925	7.475
Bartonville(19)K4	6.675	7.225
Buffalo W12	6.675	7.075
Cleveland A7	6.675	...
CrawfordsvilleM8	6.775	7.325
Donora,Pa. A7	6.675	7.075†
Duluth,Minn. A7	6.675	7.075†
Fairfield T2	6.675	7.075†
Houston,Tex. S5	7.075	7.475
JohnstownB2(48)	6.675	7.225
Joliet,Ill. A7	6.675	7.075†
KansasCity,Mo.S5	7.275	7.675
Kokomo C16	6.775	7.175
LosAngeles B3	7.625	...
Minnequa C10	6.925	7.325**
Monessen P7 (48)	6.675	7.225
Palmer W12	6.975	7.375
Pitts.,Calif. C11	7.625	8.025†
Prtsmth (18) P12	6.575	...
Rankin A7	6.675	7.075†
So.Chicago R2	6.675	6.325
So.S.Frn.(48)C10	7.625	8.025**
Spar'wsPt. B2(48)	6.775	7.325
Sterl'g(1)(48)N15	6.675	7.225
Struthers,O. Y1	6.675	7.175
Worcester A7	6.975	...

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WIRE (16 gage)	An'ld. Stone	Galv. Stone
Aliquippa J5	10.63	12.72*
Bartonville(19)K4	10.73	12.51
Cleveland A7	12.50	...
Crawfordsville M8	12.50	14.35
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35
Kokomo C16	12.60	14.15
Minnequa C10	12.75	14.45**
Palmer,Mass.W12	12.50	14.05
Pitts.,Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45
Sterling(1) N15	10.73	12.15
Waukegan A7	12.50	14.05†
Worcester A7	12.80	...

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	153
Aliquippa J5	150*
Atlanta A11	159
Bartonville,Ill. (19) K4	156
Crawfordsville,Ind. MS	159
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156
Joliet,Ill. A7	153
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153
S. SanFrancisco C10	173**
SparrowsPoint,Md. B2	158
Sterling,Ill.(1) N15	156

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.	
AlabamaCity,Ala. R2	140
Ala.City,Ala. 17 ga. R2	235
Ala.City,Ala. 18 ga. R2	245
Aliqp't,Pa.9-14½ga. J5	143*
Atlanta A11	146
Bartonville,Ill.(19) K4	143
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga.,6" B2	234
Johnstown, 4"	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140
Sterling,Ill. (1) N15	143

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	152
Bartonville,Ill.(19) K4	149
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	134
Bartonville,Ill. (19) K4	131
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. MS	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Portsmouth,O. P12	132
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, Cut (100 lb keg) to dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	133
Atlanta A11	136
Bartonville,Ill. (19) K4	133
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Portsmouth,O. P12	132
Rankin,Pa. A7	133
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	136
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	5	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown-Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	0.75	19.75	3	22.25	5.5	23.75	7	23.75	7	23	6.25	25.5	8.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		22c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (§)	...	...	...	...	...	...	23.25	7	26.25	11	28.75	14.5	31.25	15.5	31.75	16.5
Benwood, W. Va. W10(††)	25.5	+0.75	17.75	+6	10.25	+10.75	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	...	...	...	...	...	...	...	...	...	...
Etna, Pa. N2 (†)	...	...	...	...	...	...	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fontana, Calif. (§)	...	...	...	...	...	...	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	...	...	...	...	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	...	...	...	...	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (†)	26.5	−0.25	19.5	+4.25	12.5	+8.5	...	...	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Youngstown Y1 (††)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (‡)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft.	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...
Alton, Ill. L1 (§)	32.25	17	33.75	17	33.75	17	...	...	...	...
Benwood, W. Va. W10(††)	35.25	20	36.75	20	36.75	20	27.75	10.5	27.75	10.5
Etna, Pa. (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fontana, Calif., K1 (§)	22.25	7	23.75	7	23.75	7	...	...	...	...
Ind. Harbor, Ind., Y1 (††)	34.25	19	35.75	19	35.75	19	...	...	...	...
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	...	...	...	...
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	...	...	...	...
Sparrows Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	...	...	...	...
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c, (§), 11.00c; (††), 10.50c-11.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	...	21.31	18.44
1¼	13	...	25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.37	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2½	12	37.10	44.75	32.41
2⅝	12	40.51	48.86	35.70
2¾	12	43.85	52.90	38.66
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	....	5.20
Fairfield,Ala. T2	....	....	....	5.20
Gary,Ind. U5	4.325	4.225	4.275	....
Huntington,W.Va. W7	....	....	....	5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	....
Johnstown,Pa. B2	....	....	....	(16)5.20
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.125	....	5.70
Steelton,Pa. B2	4.325	4.225	....	....
Williamsport,Pa. S19	....	....	....	5.20

TIE-PLATES

Fairfield,Ala. T2	5.125
Gary,Ind. U5	5.125
Ind.Harbor,Ind. I-2	5.125
Lackawanna,N.Y. B2	5.125
Minnequa,Colo. C10	5.125
Pittsburg,Calif. C11	5.275
Seattle B3	5.275
Steelton,Pa. B2	5.125
Torrance,Calif. C11	5.275

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	11.00
Lebanon,Pa. B2	11.00
Minnequa,Colo. C10	11.00
Pittsburgh O3, P14	11.00

JOINT BARS

Bessemer,Pa. U5	5.275
Fairfield,Ala. T2	5.275
Ind.Harbor,Ind. I-2	5.275
Joliet,Ill. U5	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Steelton,Pa. B2	5.275

AXLES

Ind.Harbor,Ind. S13	6.50
Johnstown,Pa. B2	6.50

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	7.05
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.05
Minnequa,Colo. C10	7.05
Pittsburgh J5	7.05
Seattle B3	7.55
So.Chicago,Ill. R2	7.05
Struthers,O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh; f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in. larger 8.90c

⅞-in. under ..... 26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ⅞-in.	5
1-in. and larger	3
Longer than 6 in.:	
All diams.	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. & C.P., regular & heavy:	
Square, all sizes	5
H.P. Hex, regular & heavy:	
¾" and smaller	5
⅞" to 1⅛", inclusive	6
1¼" to 1½", inclusive	6
1⅝" and larger	5
C.P. Hex, regular heavy:	
All sizes	5
Hot Galv. Nuts (all types):	
¾" and smaller	4
⅞" to 1½", inclusive	4
Finished Hex Nuts:	
New standard, all sizes	5
Semifinished & Slotted Hex.:	
Regular and heavy, all sizes	5

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	3
1 in. and smaller diam. x over 6 in.	2

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	3
¼ in. diam. & larger	1
N.F. thread, all diams.	5

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Flated finishes	30 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	3
¾-in. through 1 in.	2
Longer than 6 in.:	
⅝-in. and smaller	2
¾-in. through 1 in.	7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+ % Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unatinealed (99+ % Fe)	36.50
Unannealed (99+ % Fe minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots	78.00
Brass, 20-ton lots	29.50-36.50
Bronze, 10-ton lots	51.00-60.00
Copper:	
Electrolytic	43.25
Reduced	43.25
Lead	21.75
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.00*
Zinc, 10-ton lots	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

*Plus cost of metal

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5a) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.85c; 1 15/16" to 2 5/16" 4.95c.
(6) Chicago or Birmingham base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ½" and thinner.
(16) 10 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga., 36" wide.
(24) Deduct 0.10c, finer than 22 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; add 0.35c for universal mill.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" and narrower.
(39) 48" and narrower.
(40a) Lighter than 0.035"; 0.035" and heavier, 0.25o higher.
(41) 9.10c for cut lengths.
(48) 6.7 gage.
(49) C-post; add 2 cols. for T-post.
(50) 0.025 gage; 6.55c for 0.026 to 0.068 gage; 6.65c for 0.069 gage and over.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound, subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes, H.R. & C.F. Bars, Wire	Plates	Sheets	C.R. Strip, Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	33.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L			36.75			42.75	45.25	54.25	49.00
305	19.50	25.50		39.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314							69.00	74.50	
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L			52.50			61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330			58.00			68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403			27.00	30.75		32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416			24.50	28.25		29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F		18.75	25.00	28.75		29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C		28.50	29.25	34.00		35.00	38.50	49.25	52.75
442			28.00			30.50	35.25	48.25	47.75
446			33.75	38.25	53.00	39.50	40.75	59.75	71.00
501			14.00	14.50	21.25	16.00	18.25	30.50	26.00
502			15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Division, U. S. Steel Corp.; Armco Steel Corp.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur D. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Co.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Division, Borg Warner Corp.; Jessop Steel Co.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; Page Steel & Wire Division, American Chain & Cable Co. Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Stainless Welded Products Inc.; Superior Steel Corp.; Timken Roller Bearing Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302		31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00		144.00
316	32.60	37.70-42.75	42.75	
318	37.00	42.20		
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60		
410	22.90	30.10		
430	22.90	30.10		
Inconel	41.23	54.18		165.00
Nickel	37.50	50.90		
Monel	38.90	51.80		
Copper*			46.00	

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	27.85	35.85	24.00	32.25

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont Del. C22 Coatesville, Pa. L7; New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25-.285	5% Cr Hot Work	0.39
Extra Carbon	0.33-.340	W-Cr Hot Work	0.41
Special Carbon	0.35-.360	V-Cr Hot Work	0.43
Oil Hardening	0.370-.39	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25		4.055
18.25	4.25	1	4.75		2.340
18	4	2	9		2.565-2.695
18	4	2			1.820
18	4	1			1.580-1.660
13.5	4	3			1.875
6.4	4.5	1.9		5	1.065
6	4	3		6	1.300
2	1.4	1.2			0.495
1.5	4	1		8.5	0.895

Tool steel producers include: A1, A8, B2, B8, C1, C9, C13, C18, D1, F2, J3, L3, M14, S8, U1, V2 and V3.

PIG IRON, Gross Ton

Each furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$58.00	$58.50	$59.00	$59.50
New York del		62.28	62.78	
Newark, del	61.02	61.52	62.02	62.52
Philadelphia, del	60.74	61.24	61.74	62.24
Birmingham District				
Alabama City,Ala. R2	52.38	52.88		
Birmingham R2	52.38	52.88		
Birmingham U6		52.88		
Woodward,Ala. W15	52.38	52.88		
Cincinnati, del		60.43		
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	
Tonawanda,N.Y. W12	56.00	56.50	57.00	
No. Tonawanda,N.Y. P9		56.50	57.00	
Boston, del	66.65	67.15	67.65	
Rochester,N.Y., del	59.02	59.52	60.02	
Syracuse,N.Y., del	60.12	60.62	61.12	
Chicago District				
Chicago, I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00		56.50	
Indiana Harbor,Ind. I-2	56.00		56.50	
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	
So.Chicago,Ill. U5	56.00		56.50	57.00
Milwaukee, del	58.17	58.67	58.67	59.17
Muskegon,Mich., del		62.80	62.80	
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	
Akron,O., del from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00			57.00
Pittsburgh District				
Neville Island,Pa. P6	56.00	56.50	56.50	
Pitts.,N.&S. Sides, Ambridge, Aliquippa, del	57.37	57.87	57.87	
McKees Rocks, del	57.94	57.54	57.54*	
Lawrenceville, Homestead, Wilmerding, Monaca, del	57.56	58.16	58.16	
Verona, Trafford, del	58.19	58.69	58.69	
Brackenridge, del	58.13	58.63	58.63	
Bessemer Pa. U5	56.00		56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00			
McKeesport,Pa. N3	56.00			57.00
Midland,Pa. C18	56.00			
Monessen,Pa. P7	56.00			
Youngstown District				
Hubbard,O. Y1			56.50	
Youngstown Y1			56.50	57.00
Youngstown U5	56.00			57.00
Mansfield,O., del	60.50		61.40	61.90

*Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50%, no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%.)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

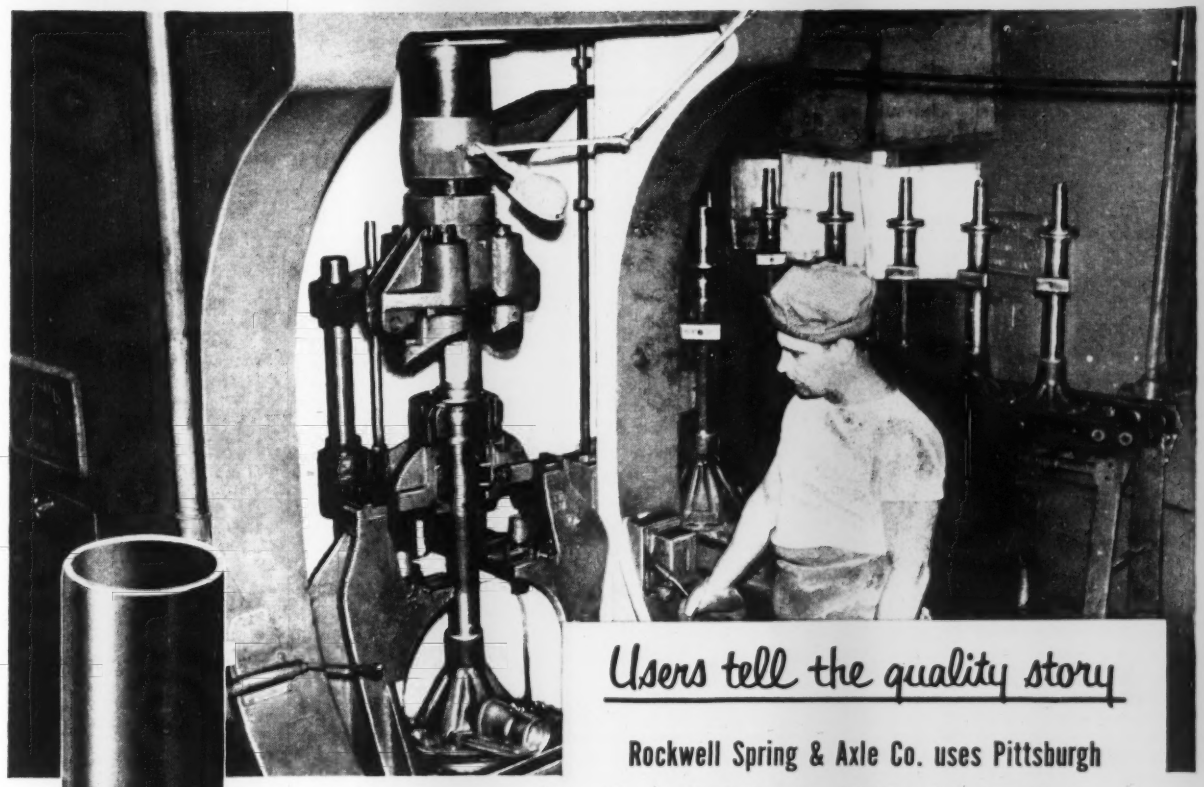
ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.15 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.015% max P.)

Niagara Falls,N.Y. P16	$91.00
Keokuk,Iowa, Openhearth & Fdry. freight allowed K2	95.50
Keokuk, OH & Fdry. 12½-lb piglets, 16% Si, frt. allowed K2	98.50
Wenatchee,Wash., OH & Fdry., freight allowed K2	95.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	58.50
Steelton,Pa. R2	64.00
Philadelphia, delivered	67.55
Troy,N.Y. R2	64.00



Users tell the quality story

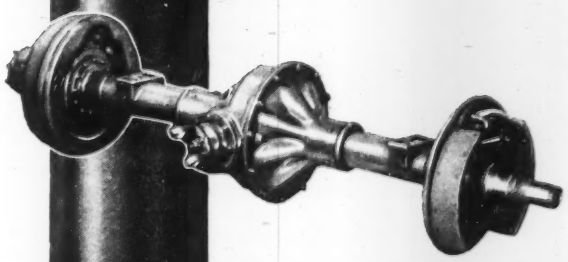
Rockwell Spring & Axle Co. uses Pittsburgh Steel Seamless Tubing for strong, safe, durable rear axle housings for trucks

In light panel trucks, built to stand up day-in and day-out under the most severe punishment, every part must be skillfully designed and precision-made from the finest materials to give the longest possible service.

The tubular steel housings running from differential to rear wheels are typical of the care and precision put into axle building by the Rockwell Spring & Axle Co. plant at New Castle, Pa. These housings not only protect the axles that transmit the power to the rear wheels but carry the truck's combined body weight and load as well.

Mr. Peter P. Dziki, Rockwell metallurgist, says, "The specifications for the steel in these housings were carefully drawn to meet Rockwell's rigid axle requirements for great resistance to bending as well as the effect of severe brake application. Pittsburgh Steel Seamless Hot-Rolled Tubing meets the specifications perfectly. Specially designed welding machines electrically butt-weld forged steel spindles to the seamless tubular section. Since this butt-weld is guaranteed for life, the welding quality of the steel is of paramount importance. Pittsburgh Steel Seamless Tubing fills the bill."

If you use seamless steel tubing in the manufacture of your product, the men in Pittsburgh Steel's tube division would like to tell you what they can do for you. Write Department S, Grant Building, Pittsburgh 30, Pa.



Pittsburgh Seamless Cold Drawn Tubing

a product of **Pittsburgh Steel Company**
Grant Building, Pittsburgh 30, Pa.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.20	7.64	7.81	7.00		6.86	8.17[6]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[2]	6.30		6.15	8.90	...	6.35	6.35	8.65
Boston	6.89	7.83	9.23	7.13		6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	9.01	6.79		6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90		7.10	8.37	..	7.10	7.10	8.37
Chicago	6.18	7.12	8.05	6.42		6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.47	6.72		6.58	7.66	12.17	6.93	6.85	7.88
Cleveland	6.18	7.12	7.90	6.58		6.34	7.65	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.34	6.71	7.36	6.56	7.60	11.92	6.93	6.85	7.80
Houston	7.15	7.85	9.32	7.45		7.45	...	...	7.35	7.20	8.55
Jersey City, N.J.	6.54	7.45	8.72	6.82		6.75	8.42[6]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.22	6.59		6.45	7.57	11.92	6.65	6.50	7.63
Moline, Ill.	6.53	7.47	8.40	6.77		6.63	7.65	...	6.81	6.68	..
New York	6.54	7.45	8.72	6.82		6.75	8.43[6]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	9.02	7.16		7.06	8.43[6]	...	6.90	6.99	8.30
Norfolk, Va.	6.90	..	..	7.20		7.20	8.50	..	7.20	7.15	7.85
Philadelphia	6.53	7.55	8.35	7.02	8.80	6.87	8.19[6]	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.30	6.55		6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	7.90	9.30	10.00	7.90		7.60	10.65	...	7.50	7.55	9.40
Richmond, Va.	6.50	7.45	8.00	7.10		7.05	7.95	...	7.10	6.85	8.10
St. Louis	6.48	7.42	8.35	6.72		6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.71	7.08		6.94	8.06	...	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60		7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	8.70	10.10	8.02		7.58	10.13	13.50	7.50	7.59	9.40
Spokane	8.15	9.25[3]	10.10	8.50		7.60	11.00[6]	14.15	7.25	7.35	9.80
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	...	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gages extra excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed; ** ¾" and heavier, 8.09c for No. 12 and lighter. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; Cold-finished bars, 2000 lb and over; [2]—500 to 9999 lb; [6]—1000 to 1999 lb; [5]—1000 lb and over; [3]—1500 lb to 3499; [6]—under ½ in.

Steel Distributors Buying Cautiously

Conservative policy reflects better balance in stocks and freer offerings from mills. Only wide flange beams and structurals remain tight in most districts

Chicago—Describing the warehouse business here, one distributor said: "We slipped out of overdrive, but we're still in high gear." Nevertheless, warehouses are aggressively seeking business on most products. Exceptions are wide flange beams and standard structural shapes, the former being the tighter. In view of the demand for wide flange beams and the limited capacity to produce them, they are expected to be in short supply even in the first quarter next year.

Plate in thicknesses of ¼-inch and 5/16-inch continue in strong enough demand that warehouses have trouble keeping it in stock.

Warehouse stocks of hot-rolled and cold-rolled carbon sheets are improved, but more could be used to fill out inventories. Stocks of hot-rolled carbon strip, galvanized sheets and small, hot-rolled and cold-finished bars are plentiful.

Boston—Distributors are cleaning out odds and ends taken in during the earlier stringency in steel supply. They are moving these frequently at price concessions. Warehouse sales are gradually improving, but few sellers are up to first half levels despite better balanced stocks. This is reflected in mill orders. Less forward buying and holding to specified volume is reported.

Warehouses are cancelling out overdue orders and rescheduling for November and beyond. Now that inventories are in balance, except for a decreasing number of sizes, lack of wide flange beams and a few other items, distributors have turned as conservative in procurement as direct consumers.

Pittsburgh—Warehouses here are concentrating on filling out their stocks. Sheets are loosening slowly, as are light plates. Structurals continue to be scarce. Noticeably easier to obtain recently are tubular products, bars, wire and tin plate.

Philadelphia—Some distributors estimate that business on a tonnage basis this month will be up about 10 per cent from August. Individual orders, they say, are smaller, but they are more numerous.

Warehouse inventories are improving. Tonnage-wise they are about normal, although this is not true with regard to specifications. One large distributor estimates that from the standpoint of proper balance his stocks are about 85 per cent of normal, although over-all stocks are up to 100 per cent.

Seattle—Distributors report a pick-up in order volume and September now is expected to make a better showing over-all than the corresponding month last year. Plates and wide flange structurals are still in critically short supply but hot-rolled sheets are more plentiful and this item is expected to be on a normal inventory basis by first quarter.

The warehouses are getting their stocks rounded out but buying is being limited and no surplus is being acquired. This policy reflects the attitude of small fabricators who are purchasing only for immediate consumption. Mills are pushing some of their products more aggressively. Prices are steady.

Los Angeles—Within the next few months distributors hope to equalize inventories. Stocks of plates and wide flange beams are slim. In easier supply are carbon steel bars, standard structural shapes and galvanized sheets. Hot-rolled sheet is freer.

San Francisco—Some complaining is heard among distributors about a falling off in business. There have been some scattered instances of price shading, but, by and large, sentiment still is one of confidence. Some distributors still are doing plenty of business and stocks have not yet reached full balance.

Cerro Bolivar Ore Begins Moving Soon

Developments at U. S. Steel's Venezuelan properties stepped up. Tonnage starts moving to tidewater late this year with ocean shipments beginning in January

Iron Ore Prices, Page 155

New York—Developments at the United States Steel Corp.'s Cerro Bolivar iron ore properties in Venezuela are being stepped up rapidly. Ore will likely start moving to Puerto Ordaz, at tidewater, late this year, with ocean shipments beginning in January.

Loading facilities have been set up at Puerto Ordaz, which is the terminus of the newly constructed 90-mile railroad line from the ore properties, and arrangements have been made with Joshua Hendy, San Francisco, to furnish ships, under a hauling contract, for the ocean movement of the first tonnages to be handled.

Meanwhile, construction is going ahead on three large ore carriers for this trade. The ships are being built in Japan for the account of the National Bulk Carriers Inc., New York, and will be used by U. S. Steel on a hauling contract basis. These ships, it is said, will be the largest cargo ships in the world. The first is scheduled to be ready for operation by the middle of next year, with the other two scheduled for completion fairly soon after that.

Each of these vessels will have a capacity for carrying 47,000 gross tons of ore, will be 750 feet long, with a 114 foot beam, and will draw 36½ feet when fully loaded.

Shipments of the Venezuelan ore will be primarily for the Fairless works in New Jersey, although there will also be a movement to Mobile, Ala., to augment ore requirements at the U. S. Steel Corp.'s furnaces in the South.

Pending action by Congress with respect to the dredging of adequate channels in the upper Delaware, the Venezuelan ore for Fairless will come at first into Philadelphia with most to be shipped the remainder of the way by rail, such as is now being done on ore shipments for Fairless works from other parts of the world.

At present, imported ore for that point is coming into Philadelphia, the bulk continuing on by rail, but with some of the smaller ships being unloaded only sufficiently to enable them to proceed under lighter draft up the river to the Fairless plant with the remainder of the tonnage.

Cleveland—Consumption of Lake Superior iron ore declined slightly in August compared with the preceding month but was up noticeably from use in the corresponding month of 1952, reports the Lake Superior Iron Ore Association.

August consumption was 8,150,002 gross tons, comparing with 8,239,021 in July and with 7,275,561 in August a year ago. Cumulative consumption this year to the end of August totals 64,513,433 gross tons, of which 61,537,422 were consumed in the U. S. and 2,976,011 in Canada. These figures compare with total use of 46,608,971 tons in the like period of 1952, of which 44,001,655 tons were consumed by U. S. furnaces and 2,607,316 by Canadian stacks.

Total stocks of Lake Superior ore at furnaces and on Lake Erie docks on Sept. 1 were reported at 45,579,307 gross tons, of which 5,591,022 were on docks, 2,351,493 at Canadian furnaces and 37,636,792 at U. S. furnaces. At the beginning of August stocks totaled 38,828,970 tons of which 32,501,209 were at U. S. furnaces, 1,942,126 at Canadian furnaces, and 4,385,635 on Lake Erie docks. On Sept. 1 a year ago stocks totaled 34,136,891 gross tons, 28,269,672 being at U. S. furnaces, 1,179,119 at Canadian furnaces and 4,688,100 on Lake Erie docks.

Active blast furnaces using lake ore on Sept. 1 numbered 189, of which 180 were in the U. S. and 9 in Canada. This compares with 190 active on Aug. 1 and 185 a year ago.

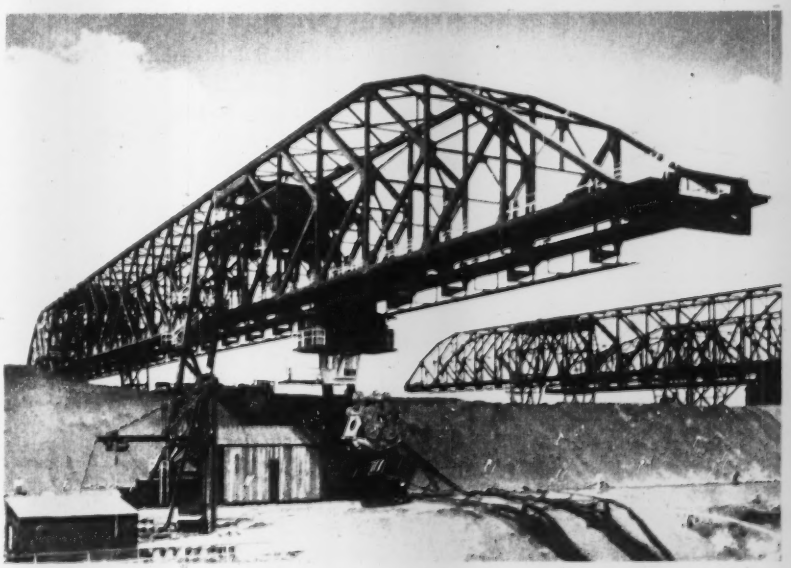
Shipments of ore from the head of the lakes are continuing in large volume totaling 3,042,765 gross tons in the week ended Sept. 21 and bringing the season total to date to 74,865,706 tons, only about 45,000 tons under the total movement for the entire 1952 lake shipping season.

Steel Shipments Gain Shown

New York—Steel shipments totaled a record high of 48,939,374 net tons in the first seven months this year, reports the American Iron & Steel Institute. In July shipments of 6,582,513 tons were the largest ever attained for that month. Practically all consuming classes received more tonnage to date this year than in the like 1952 period.

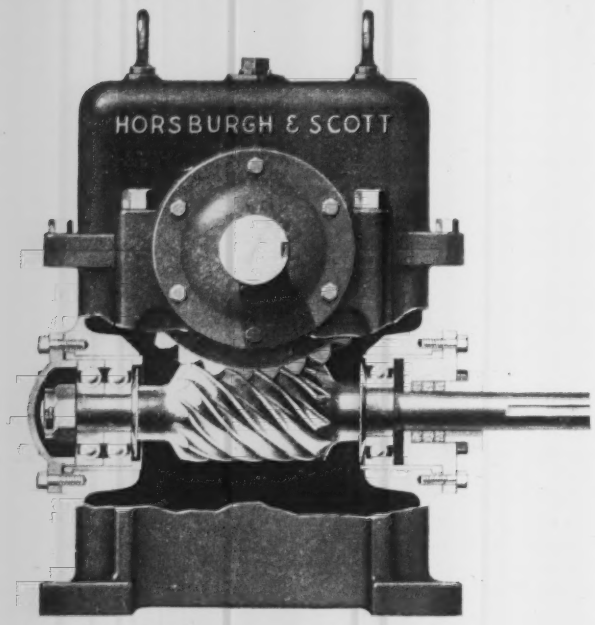
In the first seven months the automotive industry received over 9.4 million tons or 20 per cent of total domestic shipments, and comparing with 5 million tons or 15.5 per cent of the total in the like period of 1952. Shipments to household appliance makers increased slightly less than 700,000 tons in the period.

Munitions took more than 1.6 mil-



Bethlehem Steel Erects Additional Ore Bridge

This new ore bridge (foreward) is in operation at Bethlehem Steel Co.'s plant at Bethlehem, Pa. It is an example of new facilities designed to raise the firm's annual ingot capacity to 19 million tons. The bridge is one of four serving a stockyard capable of storing 1.2 million tons of ore obtained chiefly from the Great Lakes region. A 15-ton bucket loads ore into transfer cars



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by Horsburgh & Scott

Every modern element for reducing friction and other losses is incorporated in these reducers...hardened and accurately ground worm made from special case hardening steel, accurately made gear from chilled bronze to H & S specifications, anti-friction bearings, accurate alignment, smooth streamline interiors and proper lubrication. Due to its glass hardness, worm wear is nil...due to its accuracy, gear wear is negligible. Throughout their long life these reducers maintain their initial high efficiency.

10 ADVANTAGES

Extreme Simplicity	Extra Strength
Compactness	Low Maintenance
Efficiency	Oil-tight Housing
Long Life	Quiet Operation
Smooth Transmission	Wide Range of Ratios

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

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Send note on Company Letterhead for Speed Reducer Catalog 46

lion tons in the first seven months this year, an increase of over 650,000 tons from a year ago.

Warehouses received nearly 9 million tons in the seven months, a gain of 2.3 million over last year.

Sheets, Strip . . .

Sheet and Strip Prices, Page 132 & 133

Philadelphia Where tonnage can be had at regular prices, demand for hot and cold-rolled sheets is active, although less pressing than a few weeks ago. Effects of the automotive slackening are felt here and are particularly responsible for easing in this district.

Not only are the effects directly felt in some instances, but indirectly as seen in somewhat freer delivery promises which have caused district consumers in most lines to become more inventory conscious than heretofore. These consumers are more selective in their requirements and, above all, are more adamant in their refusal to pay premiums.

Meanwhile, supply in the East is being augmented by more and greater diversified tonnage from the Fairless Works of U. S. Steel Corp. where the new slabbing mill is getting into operation. The Conshohocken, Pa., producer recently placed new pickling equipment in operation at its sheet and strip mill.

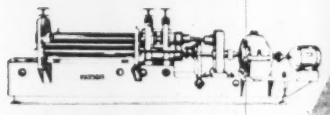
Boston More freight absorption on flat-rolled products appears likely in first quarter, possibly before. Actually this has been done on stainless and specialties for some time, items on which profit margins are sufficient. Stainless prices based f.o.b. Baltimore, Syracuse and Watervliet, N. Y., are being met delivered consumer's plant. Other higher margin specialties are in this category.

New York Less pressure is noted in demand for sheets. Premium priced tonnage is practically out of the picture, and while there have been few cancellations, there have been some requests for shipment postponements. Where cancellations have developed in hot and cold carbon sheets, however, producers have been able to dispose of the tonnage elsewhere and, in the main, the market is still active.

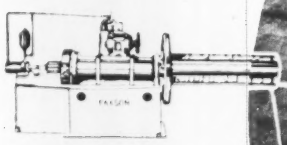
Pittsburgh A sellers' market through remainder of this year is predicted by producers who continue to express optimism regarding sheet sales. While some consumers aren't getting all the sheet they need, others are reducing inventories from a 75-day stock to a 10-day supply, resulting in a spotty over-all picture.

Cleveland Sheetmakers will enter fourth quarter with substantial ton-

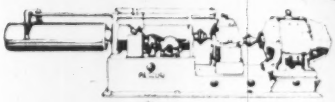
PAXSON GIVES YOU THE EDGE



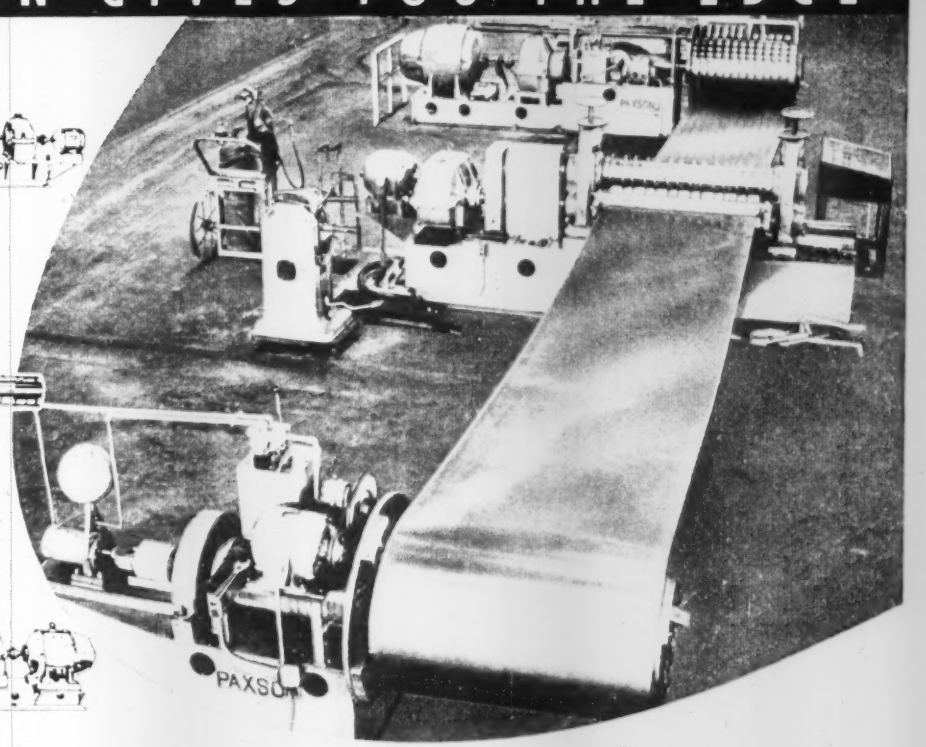
SLITTERS

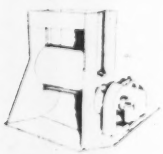


PAY-OFF REELS



COILERS





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&
ROTARY SCRAP
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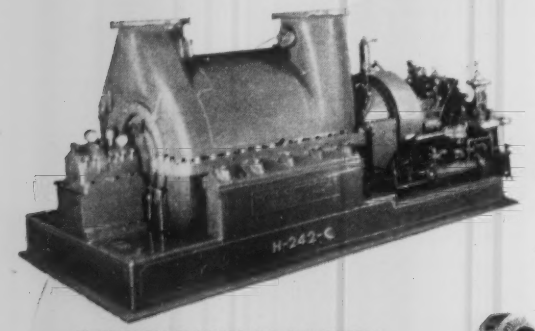
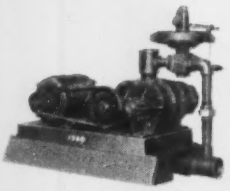
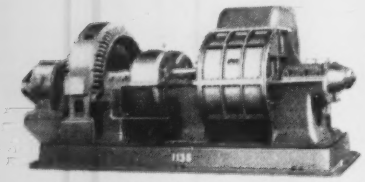


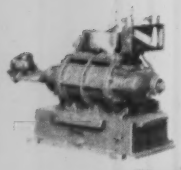
CENTRIFUGAL BLOWERS AND EXHAUSTERS
single and multi-stage units, in capacities from 2,000 cfm to 100,000 cfm or higher, at maximum practical pressures.



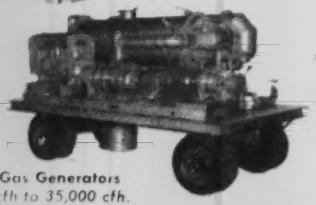
Rotary Positive Gas Pumps
5 cfm to 50,000 cfm.



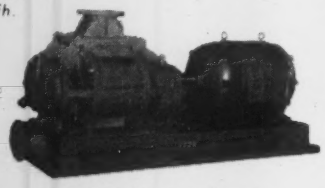
Rotary Positive Blowers and Exhausters
5 cfm to 50,000 cfm.



Positive Displacement Meters
4,000 cfh to 1,000,000 cfh.



Inert Gas Generators
1,000 cfh to 35,000 cfh.



Cycloidal Vacuum Pumps
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WE *Specialize* IN YOUR PROBLEMS OF MOVING GAS OR AIR!

You may need to move a thimbleful of gas . . . or create a cyclone of whirling air. Whatever your problem, we've probably met something close to it, in experience of almost a century of building such equipment.

Another reason why we know so much about this job is that it's all we do. Our customers range from the "giants of industry" to the neighborhood plant, both of whose production depends upon continuous, reliable, economical performance of air and gas handling units. Because we build the exclusive *dual-ability* line of Rotary Positive and Centrifugal Units, in a wide range of sizes, we offer a *dual choice* which permits completely unbiased recommendations.

So—if you have a problem today—or anticipate one a year or five years from now, we suggest you call upon the facilities of R-C Specialists. Write for bulletins on any specific equipment.

ROOTS-CONNERSVILLE
Exclusive Specialists in Handling Gas and Air

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nage on their books although demand pressure from some directions is not as intense as it was some time back and consumers are inclined toward more conservative buying policies. However, there is nothing in the market as yet to indicate use is contracting to such extent as to force early curtailment in sheet production.

Detroit—Sheet demand continues to show no serious dents in this area as the traditionally slower fourth quarter approaches. As vendor performance improves and yearend approaches, customers are tending to cut inventories.

Cincinnati—One of the sheet mills in this area has had quite a few cancellations, so it has been cutting back. Its order book is filled through October and part way through November.

Chicago—Carbon steel sheets, both hot and cold-rolled, continue in strong demand, although there have been increases in cancellations. Wherever there has been a cancellation producers have been able to assign the tonnage to someone else.

St. Louis—Sheet demand is softening a trifle but is still good. Galvanized is on a definite upgrade as farmers complete harvest and turn to building repairs.

Los Angeles—Cold-rolled strip mills with relatively small capacity are overloaded. Cancellations are more frequent but are immediately taken up.

Semifinished Steel . . .

Semifinished Prices, Page 132

Chicago—The 40-inch blooming mill in Inland Steel Co.'s plant 2 at Indiana Harbor, Ind., is scheduled to go out of operation today, Sept. 28, for dismantling. It will be replaced by a 46-inch bloomer, the new mill to be in operation in about a month. When it is installed, plant 2 will have two 46-inch blooming mills. The new mill will boost the company's blooming facilities into line with its open-hearth capacity.

Steelmaking in the Chicago district during the week ended Sept. 26 eased down to 99.5 per cent of capacity. That's a 2 point decline from the revised rate for the preceding week.

Buffalo—The district steel rate rebounded to 106.5 per cent of capacity last week as Bethlehem's Lackawanna plant resumed operation of 29 out of 32 open hearths as the wildcat strike in the plant's coke department ended. The district pig iron production rate also returned to 94 per cent as Bethlehem blew in 7 strike-idled blast furnaces.

Quantity Production . . .

- Quantity production of identical gears offers a challenge that we here at BRAD FOOTE are eager to accept.
- Multiple spindle machines, duplicate machines, numerous and varied machines, every machine that's needed—PLUS men of long experience making close tolerance gears . . . these factors make it possible for us to confidently accept such a challenge.
- When you specify BRAD FOOTE gears, you do so with the knowledge that each gear will be made to exact specifications; that every gear of a quantity will be identical in structure, in size, and in appearance; that each operation on every gear will be performed by BRAD FOOTE people in BRAD FOOTE shops. No one will share our responsibility.
- You will be satisfied with the BRAD FOOTE gears you buy because they will give long, economical service on the equipment you operate, or on the machines you sell to others.
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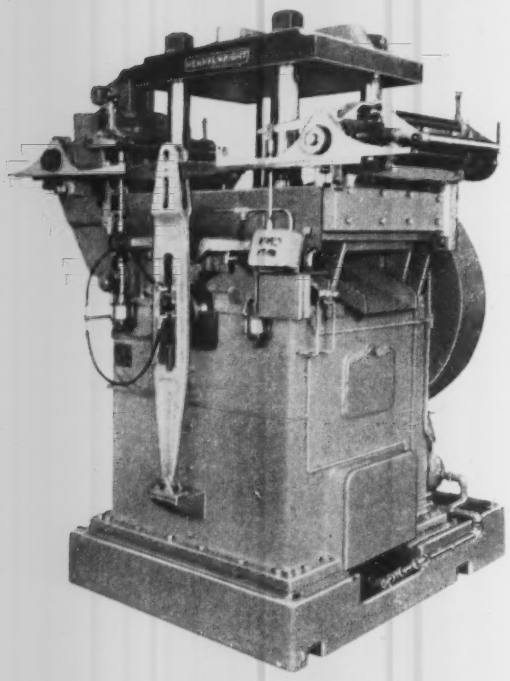
A PROFIT WITH EVERY STROKE



Our customers say that. It figures. One Dieing Machine does the work of five to ten conventional stamping presses. One stroke—a complete part. One inspection. One trip for parts removal. Speed—you can pull out the throttle. Die life—longer for two reasons. (1) Stability, minimum vibration, extreme precision of tools alignment. (2) Dies take less of a beating; less metal needs to be removed for sharpening. Our men can give you the whole Dieing Machine story. If you want to cut costs, now's the time to talk to one of them—a note from you will have an H & W man on deck promptly.

NEW CATALOG Up to the minute facts on Dieing Machines. Capacities now range from 25 tons to 2500 tons. Catalog gives specifications up to 400 ton machine. Write Henry & Wright, 441 Windsor St., Hartford, Connecticut.

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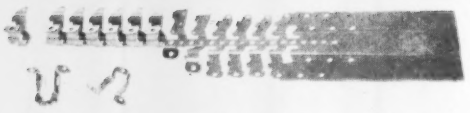
TYPICAL JOBS THAT SHOW A PROFIT AT EVERY STROKE



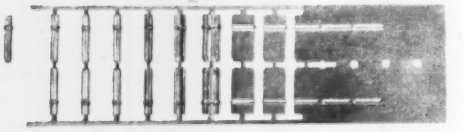
Automotive stamping produced complete per stroke from $\frac{5}{32}$" thick by 13" wide hot rolled steel in coils on 200 ton Dieing Machine, single gear type, equipped with progressive die. Speed approximately 45 strokes per minute.

Ball bearing retainer produced complete in 75 ton Dieing Machine operating at speed of 95 strokes per minute. Made from $4\frac{1}{8}$" wide by .034" thick cold rolled steel.

Ferrule. One completed piece produced per stroke in 50 ton Dieing Machine operating at speed of 90 strokes per minute. Made from $\frac{9}{16}$" diameter by $\frac{7}{8}$" long by .030" thick cold rolled steel.

C Clamp Frame. Both halves produced complete in 150 ton Dieing Machine operating at speed of 65 strokes per minute. Material cold rolled steel .086" by $4\frac{5}{8}$" wide.

Support bracket produced complete one per stroke in 150 ton Dieing Machine operating at speed of 60 strokes per minute. Made from .062" thick by $7\frac{1}{4}$" wide cold rolled steel.



Radio tube prong produced complete in 25 ton Dieing Machine at rate of 450 pieces per minute. Made from brass .012" by $1\frac{7}{16}$" wide.

Bathroom fixture produced in 60 ton Dieing Machine operating at speed of 100 strokes per minute. Made from .032" thick by $1\frac{3}{4}$" wide cold rolled steel.

Hardware item. One completed piece produced per stroke in 100 ton Dieing Machine operating at speed of 75 strokes per minute. Made from 3" wide by .040" thick cold rolled steel.

Plates . . .

Plate Prices, Page 132

Philadelphia—While there are some cutbacks, plate demand continues active, and most eastern mills expect a high rate of operations throughout remainder of the year. Only where premiums continue exceptionally high does there appear to be any doubt as to high production of sheared carbon plate.

At least two eastern producers anticipate capacity operations in the fourth quarter, and prospects for beyond have been given a lift by the recent announcement of the Navy that it was going to rush new ship contracts, in which private yards would largely particiapte.

Boston—Plate mill schedules are filled through remainder of the year, higher premium price mills excepted.

A small number of plate consumers are holding up or deferring late fourth quarter tonnage, but this volume is readily sold in other directions.

New York—While there is less pressure for steel in general, demand for plates is holding up better than for most products. There is less interest in premium-priced tonnage, but premiums haven't disappeared entirely, and for the general run af carbon plates available at minimum mill prices, there is still brisk demand.

Pittsburgh—Demand for both light and heavy plates still exceeds supply with balance expected no earlier than first quarter of 1954. Structural fabricators need more plates than they can obtain, while several other consumers are lessening their clamor for tonnage.

Seattle—Plate fabricators are interested in the 615-mile tidewater to Fairbanks, Alaska, oil pipe line, bids to the U. S. Engineer, Seattle, Oct. 14, and the 600-mile, 8-in. pipe line from Billings, Mont., to Spokane, Wash., bids in the near future. Awards are pending for 1850 tons for Army storage facilities and 1750 tons for the Puget Sound Navy yard. Bids for Ladd Field, Alaska, bulk storage tanks, scheduled for Sept. 15, tonnage unstated, have been postponed by the U. S. Engineer.

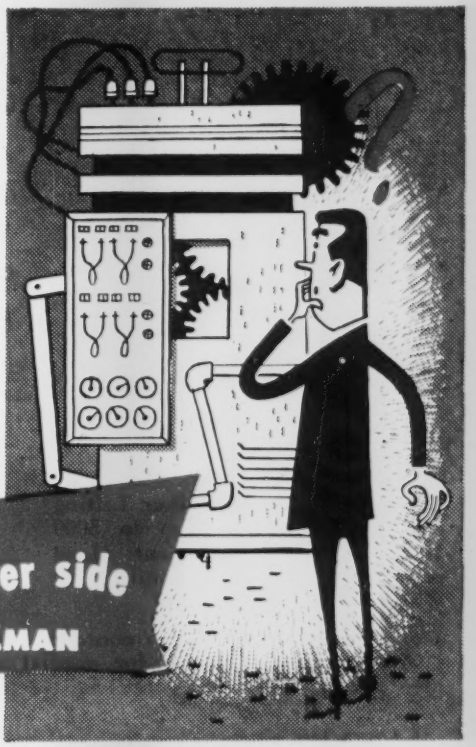
Rails, Cars . . .

Track Material Prices, Page 135

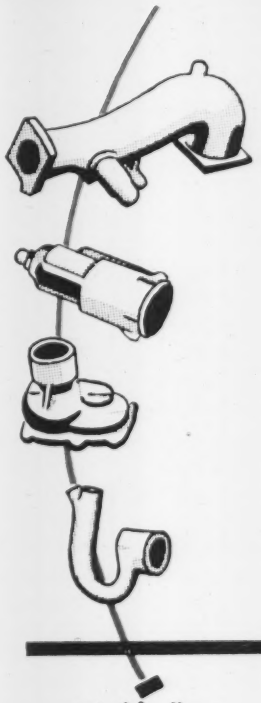
Philadelphia—Pennsylvania railroad will close bids on 100,000 tons of rail Sept. 30 for laying next year. This is an increase of 25,000 tons over the amount inquired for a year ago at this time, and is the first of two large inquiries expected to be issued by eastern railroads.

The freezer's automatic
The stove and TV too
The washer shuts itself off
Then starts itself anew

The car's a Mushomatic Eight
Remote controlled by knee
And who's in charge of all
this stuff?
Unautomatic me!



CASTINGS
on the lighter side
by WELLMAN



If weight is a factor in the product *you're* in charge of purchasing, engineering or manufacturing, turn *automatically* to WELLMAN.

We're been in charge of producing castings on the lighter side, aluminum and magnesium, for almost half a century. Our four complete plants assure you the controlled quality and the easy machinability that help shut off your production problems.

Catalog No. 53 will fill you in on the details.

Well-Cast MAGNESIUM AND ALUMINUM CASTINGS
Well-Made WOOD AND METAL PATTERNS

THE WELLMAN BRONZE & ALUMINUM CO.
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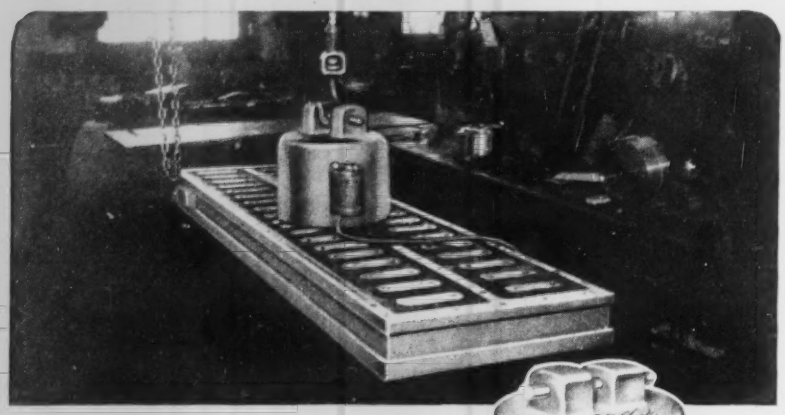

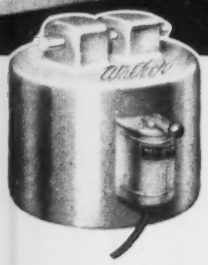

Pound for pound, volume for volume, the strongest magnet made.

This 12" diameter Walker Lifting Magnet holds work up to 5000 pounds. Highly efficient along production lines for handling all types of work pieces.

The Walker line includes contoured lifting magnets increasing the area of contact for special applications (for wire, pipe, etc.). Your lifting problems can be solved by Walker.

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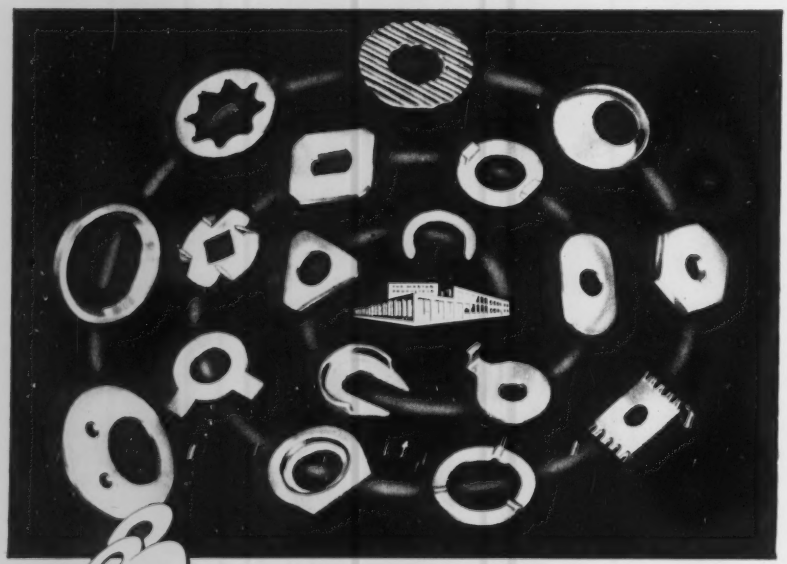
Special Washers { ANY METAL ANY SIZE ANY QUANTITY

OVER 15,000 SETS OF TOOLS AT YOUR DISPOSAL



THE *Master Products* CO.

6400 PARK AVENUE • Diamond 1-1740 • CLEVELAND 5, OHIO

Steel Bars . . .

Bar Prices, Page 132

Cleveland—While consumer pressure for bars is off as compared with some months back, producers are behind on deliveries and will enter fourth quarter with substantial carryover tonnage, especially in the larger sizes. Some consuming lines are noticeably less disposed to order tonnage but still the mills in this area report little difficulty in booking sufficient business to assure capacity operations through fourth quarter.

New York — Hot-rolled bars are easing in demand. Few cancellations are noted but there have been some cutbacks. Softness is noted particularly in smaller sizes, 1½-inches and under. This reflects slackening requirements of bolt and nut manufacturers, cold drawers and small forge shops, as well as less pressure from distributors.

Philadelphia — Of the major tonnage items, bars have eased up the most. Supply and demand in the smaller sizes of hot-rolled carbon bars are fast reaching balance, and while the larger sizes, 2-inches and over, are still in tight supply, the situation is less stringent than it was.

Pittsburgh — Hot-rolled bar producers have well-filled fourth-quarter order books in spite of sporadic pauses in buying due to inventory adjustments.

Demand is softening for cold-finished and alloy bars.

Tubular Goods . . .

Tubular Goods Prices, Page 135

Pittsburgh — Seamless tubing demand is holding up well, though some weak spots are developing in sales. Fourth quarter order books are filling satisfactorily, however.

Electric-weld tubing, a sensitive market indicator, is running stronger than manufacturers predicted early this summer. This finished item is in strong demand.

Mercer Tube & Mfg. Co., Sharon, Pa., reduced prices on galvanized steel pipe in sizes from ½-inch to 3 inches inclusive, standard and extra heavy, plain end and threaded and coupled. The action reflects a reduction in the price of zinc.

Boston—Competition for buttweld pipe at the distributor level has softened prices. With ample stocks, pipe warehouses are not taking anything near the volume offered and direct shipment orders do not fill up the gap. Several mills are promising buttweld shipments as close as two weeks.

San Francisco — Pacific Gas &

dependable delivery

Crucible's vast network of warehouses is the nation's largest distribution organization exclusively for alloy and other special purpose steels. In principal cities from coast to coast we maintain complete stocks of AISI bars and strip—the finest quality brand of alloy steel available anywhere.

Why build up inventories when you can depend on prompt, short haul deliveries from a nearby Crucible warehouse? And when it comes to quality, nobody makes a more uniform, higher grade of steel than we do. That's why we've been leaders in the specialty steel business for over 50 years.

Next time you need alloy, or any other special type of steel be sure you call Crucible.

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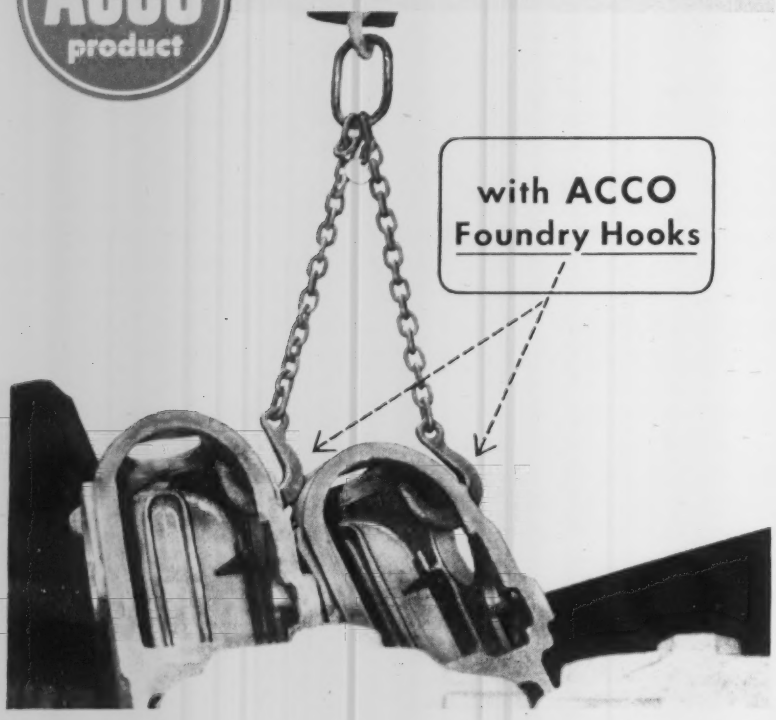

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• Castings frequently are odd shaped and hard to hitch to with regular sling hooks. So AMERICAN developed the series 500 ACCO Foundry Hook with rounded point and wide mouth that can be hooked to a wide variety of lifts.

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ACCO Foundry Hooks are safer than home-made hooks. And they're cheaper because you save the cost of fabricating and assembling to the chain in your plant. The completed unit bears the well-known ACCO *Registered* identification ring—your assurance of highest sling chain quality.

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American Chain

Electric Co. plans a 220 mile parallel pipe line to bring natural gas into northern California from Texas. The facility will cost an estimated $25,581,605.

Seattle—Cast iron pipe sales agencies report business slow and competition keener for what tonnage is offering. Portland, Oreg., has taken bids for 500 tons of various sizes for stock. North Bend, Oreg., has purchased 100 tons, 10 and 8-in. Port Angeles, Wash., has called bids Oct. 1 for 11,000 feet of 8 and 6-in., class 150.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 135

New York—Fairly prompt deliveries can be made on most sizes of bolts and nuts. Backlogs are tapering at most plants, possibly averaging around four to six weeks. Small assembly fasteners are in especially easy supply.

Government buying is virtually nil for the first time in many months. Also, some consumers are endeavoring to liquidate surplus stocks, sending out mimeographed lists for resale.

Structural Shapes . . .

Structural Shape Prices, Page 132

Boston—Larger fabricating shops are generally booked through first quarter, 1951, on girder and stringer bridge tonnage. Heavy inquiry expected out for estimates in the next few weeks will be fabricated in second quarter or later.

Deliveries with district shops, fabricating smaller tonnages which include relatively more building work, are under three months in most cases with backlogs holding at about that range.

New York—While wide flange beams are still in tight supply, standard shapes are definitely easier, tonnage being available in November on some sizes. Meanwhile, structural activity in general remains brisk, with bridge work still outstanding.

Philadelphia—Inventories of structural fabricators are approaching normal in standard shapes, but they are far from normal in the wide flange sections. Not only do fabricators have difficulty obtaining wide flange material from the mills, but also from the warehouses which are cleaned out of such tonnage about as fast as it is received. Fabricators also still find plates on the tight side.

Pittsburgh—Wide flange and other structural shapes continue in tight supply in this area, with no sign of easing. Plans have been drawn for

Spare Parts for People

—better than the Original Equipment

Somewhere, sometime, someone will walk, run, stand straight and strong again, thanks to the "spare part" pictured here. It is a Roger Anderson Femoral Head to the medical men, the "ball" of a hip joint to us laymen.

And it is actually *better* than the broken part it will replace. It won't break, pit, corrode or wear out. The strong, slender, thin-walled tube that supports the actual head is far more resistant to bending and breaking stresses than a much more massive human bone. The entire structure is super-smooth, will stay that way for life. No future replacements will be needful. The tube is a short length of Carpenter stainless tubing, delivered "ready-for-use" after simple fabrication.

It is not probable that you will have a similar job for Carpenter stainless, but whatever your tubing requirements you will find, like this customer, that service-satisfaction is sure when you call Carpenter.

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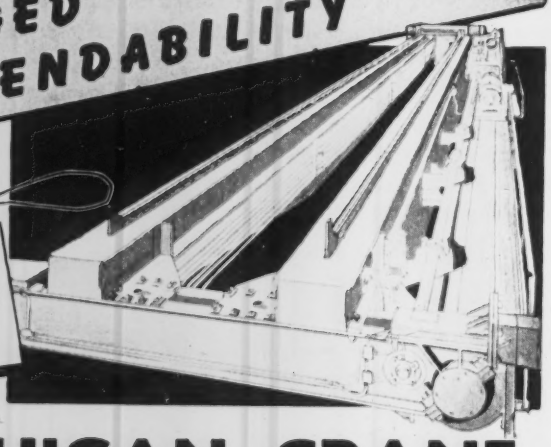

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construction of a hotel, a state office building, three other office buildings and a parking garage in a 23-acre area of downtown Pittsburgh.

Chicago — Structural fabricators are still exerting a strong demand for wide flange beams and standard structurals. Because of the country's limited capacity for production of wide flange beams, supply can't keep up with demand.

Seattle—American Bridge Division, U. S. Steel Corp., has been awarded 3600 tons of shapes for the Columbia river bridge in Umatilla county, Oreg. Other placements bring last week's total in the area to more than 5000 tons. Considerable tonnage is pending. Supplies are easier except for wide flange sections.

Wire . . .

Wire Prices, Page 134

Boston—Cancellations include some rod and finished drawn wire orders. Until late second quarter there was a shortage or lack of balance in rod inventories with non-integrated mills, a condition that had prevailed for many months. With rod cancellations, the cycle bringing wire mill schedules current is completed.

Pittsburgh — Merchant wire sales are beginning to pick up, as the farm market recovers. With harvest season ending, farmers are making repairs, buying more wire. This increased activity is expected to bolster sale for several weeks.

Los Angeles — Reduced production schedules and model changeovers limit automotive requirements for alloy and spring steel wire. Demand for nuts and bolts lags.

Tin Plate . . .

Tin Plate Prices, Page 134

Cleveland — Canmakers are not pressing for tin plate and tonnage is available from the mills for last quarter. Consumers' stocks are reported substantial. They are seeking to adjust inventories downward.

National Can Corp., Chicago, plans to open a manufacturing plant in this area. The corporation has leased a 1-story building at 5200 Harvard Ave., here. It recently purchased the can division of the Standard Oil of Ohio and will manufacture cans for Standard in the newly leased plant.

Chicago — Reflecting the reduced demand for tin plate, a large producer in this district is operating its tin plate facilities at only 77 per cent of capacity and has had to lay off some employees in this department of the company.

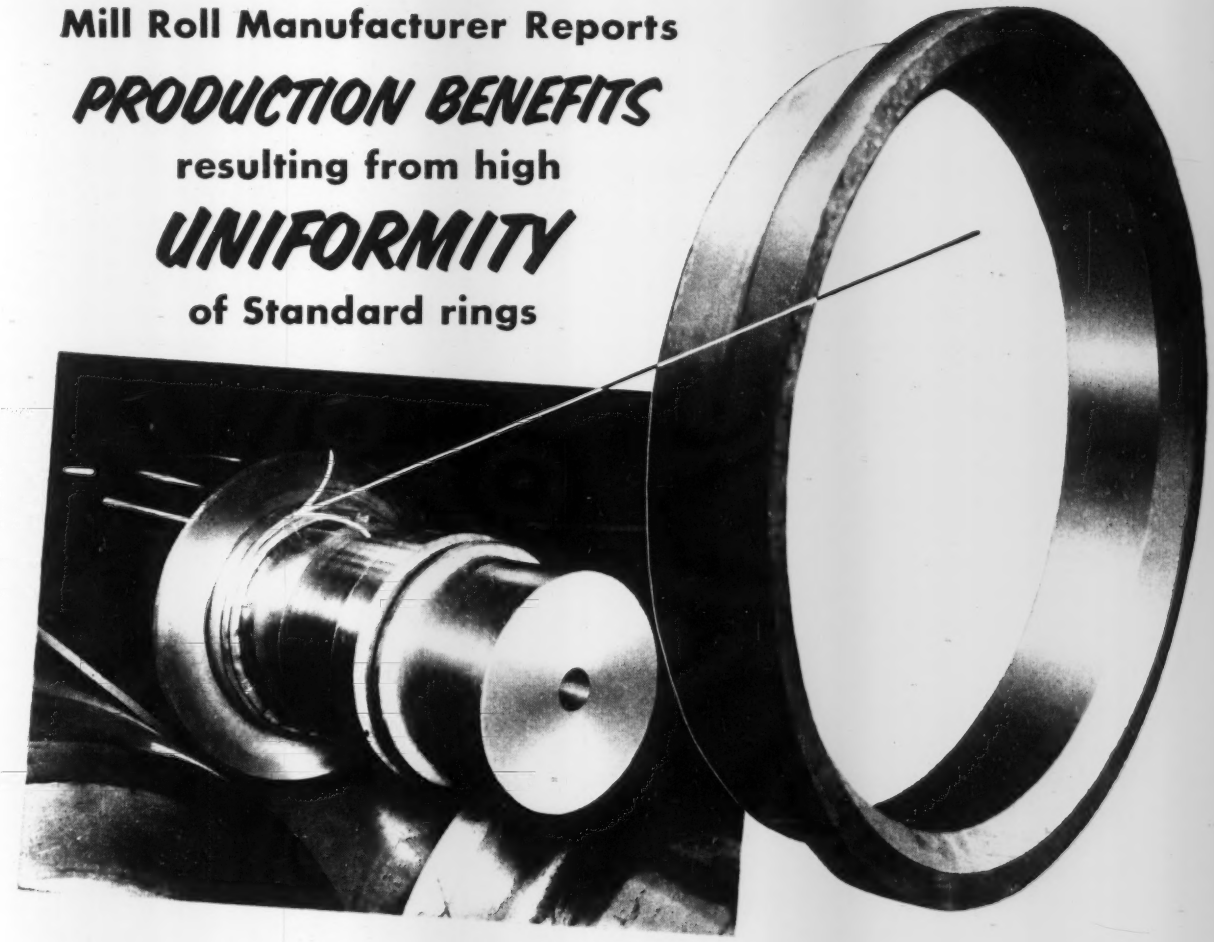
Mill Roll Manufacturer Reports

PRODUCTION BENEFITS

resulting from high

UNIFORMITY

of Standard rings



By exercising precise control of forging and rolling operations, the Standard Steel Works Division assures greater *uniformity* in the structure and analysis of each ring.

Typical of performance records is a report from a large eastern manufacturer of mill rolls where Standard rings are employed as thrust rings (inside bearing raceways) on the finished roll. Not only do they report a 50% saving in cost, but they also find that the grain structure, analysis and precise specification of the steels used in Standard Steel weldless rings is of the highest caliber.

Thus another reason why you should standardize on Standard Steel rings and flanges to protect the quality of your products is the fact that you can be certain of Standard's uniformity in manufacture.

ONE OF SIX REASONS why you should always call Standard Steel for rings and flanges.

1. Quality Steel—through production of own steel by acid process.

2. Uniformity—assured by precise control of forging and rolling operations.

3. Testing—radiographic tests, tensile tests, hardness tests, ultrasonic probing of internal structure, etc.

4. Capacity—unsurpassed ability to produce weldless rings all the way up to 144" O.D.

5. Experience—produced by skilled workmen with 20 to 40 years experience.

6. Fast Service—a vital factor in the continuing growth of Standard Steel for over 150 years.

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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $260, Clairton, Duquesne, Johnston and Sheridan, Pa.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.
(Mn 76-80%) 13.15c per pound of contained Mn, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.
(Mn 79-81%) Lump, $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max.). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max. Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l., packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025% C (simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr. 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.10. **Primos and High Speed Grades** (V 35-55%, 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) c.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb or briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.ob. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 10,000 lb W or more, $4.35 per lb of contained W; 2000 lb W to 10,000 lb W, $4.45; less than 2000 lb W, $4.57, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max, ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c. Packed c.l. 15.50, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

CORROSION which protects rather than destroys

THE RUST-PROOFING of iron and steel products is a "sacrificial" function of metallic zinc which for many years has accounted for the metal's largest single use. Nearly 50% of all the zinc consumed in the United States is used for galvanizing. This "sacrificial" characteristic of zinc in providing iron and steel with low-cost protection against rust is also responsible for the increasing use of the metal in the form of anodes for the cathodic protection of pipe lines and other underground iron and steel structures. The property of zinc which makes this possible is due to the metal's advantageous position in the electromotive series. As indicated by the listing on the right, zinc — of the commonly available metals — stands far enough below iron so that its electronegative potential provides effective and economical cathodic protection, but not so far as to sacrifice itself needlessly in doing its job.

ELECTROMOTIVE SERIES of the COMMON METALS*

Vs. H_2		Vs. Iron
+1.36	Gold	+1.80
+0.86	Platinum	+1.30
+0.798	Silver	+1.23
+0.344	Copper	+0.78
0.000	HYDROGEN	+0.44
−0.12	Lead	+0.32
−0.14	Tin	+0.30
−0.23	Nickel	+0.21
−0.40	Cadmium	+0.04
−0.44	IRON	0.000
−0.56	Chromium	−0.12
−0.762	Zinc	−0.32
−1.33	Aluminum	−0.89
−1.55	Magnesium	−1.11

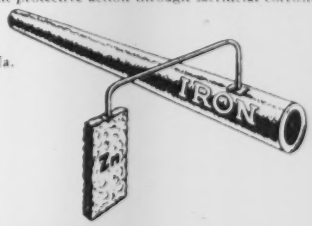
*U. R. Evans, "Metallic Corrosion, Passivity & Protection"

Rusting is an electrochemical action in which iron replaces hydrogen, or a metal, in an electrolyte. Each metal has its own definite activity in this respect, which is termed its electro-potential. A list of the metals arranged in increasing order of activity, with their electro-potential expressed in volts is called the Electromotive Series. For convenience — at the right hand side of the above table — the zero point has been placed at iron and the figures, since they are relative only, have been transposed to show the metals' activity relative to iron.

I. Tin, electro-positive to iron, has no protective action.

II.

II & IIa. Zinc, electro-negative to iron, with a driving voltage of 0.5 volt more than iron in soil or water, provides efficient protective action through sacrificial corrosion.



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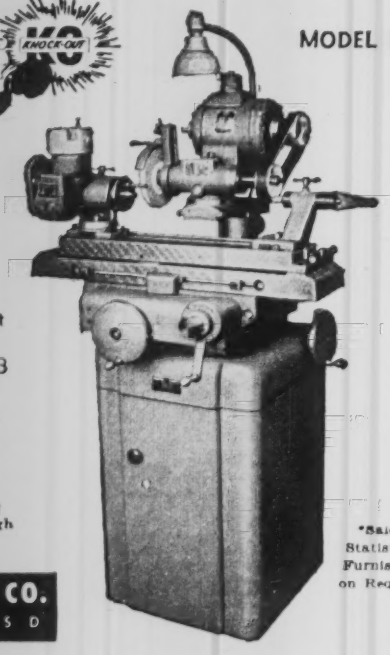

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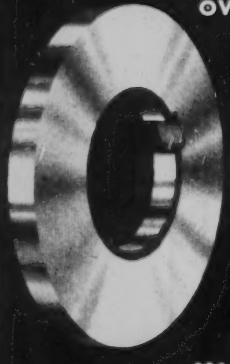

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ORES-COKE-REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$55.00
Domestic scheelite, mine	63.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. $32

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109.00; Salina, Pa., $114.00; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115.00; Hays, Pa., $120.00; Niles, O., $123; E. Chicago, Ind., Joliet, Rockdale, Ill., $125.00; Cutler, Utah, $116.55, Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $197.50; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109.00; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140.00; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.00.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174.00; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179.00; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $255.00; Danville, Ill., $258.00; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Millersville, Martin, Gibsonburg, Woodville, O., $13.75; Thornton, McCook, Ill., $13.85; Dolly Siding, Bonne Terre, Mo., $13.65; Narlo and Bettsville, O., $14.50.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00
New River foundry	20.80
Wise county foundry	15.95
Wise county, furnace	15.20

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.00
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
St. Paul ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44.45
Birmingham area	$49.50

Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums)	17.25

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Metallurgical grades f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

Inches	Length	Cents per lb
GRAPHITE		
Diam.		
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
CARBON		
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 132

Los Angeles—Fabricators will sharpen pencils in competition for the new $87 million state highway construction program, expected to sustain demand for reinforcing material.

Seattle—District rolling mills are engaged at capacity. Oregon Steel Mills in particular has a heavy backlog. Plants have sufficient orders to carry to the end of the year. Pending tonnage represents large volume. Small jobs are numerous.

Scrap . . .

Scrap Prices, Page 158

Washington—Consumption of scrap and pig iron totaled 11,120,000 gross tons in July, reports the United States Bureau of Mines. This was a decrease of 413,000 tons from the June total.

Purchased scrap use during the month was 2,948,000 tons, home scrap 2,605,000 tons, and pig iron 5,567,000 tons. This compares with 2,835,875 tons, 3,115,295 tons, and 5,581,403 tons, respectively in the preceding month.

Preliminary figures indicate stocks of scrap and pig iron held by consumers increased during July. Purchased scrap stocks amounted to 4,572,000 gross tons, home scrap 1,300,000, and pig iron 2,052,000 tons.

Boston—Steelmaking scrap prices continue to sag. Both heavy and light grades are lower with hardly enough volume in No. 1 heavy melting and No. 1 bundles to establish a market. Cast grades are also slow with foundries generally operating off inventories.

New York—Brokers have again reduced their buying prices. Consumption continues slack with most price changes more or less nominal. Brokers now are offering $26.50 to $27.50 for No. 1 heavy melting steel and No. 1 bundles, $24 to $25 for No. 2 heavy melting, and $22 to $23 for No. 2 bundles.

Philadelphia—Scrap demand continues listless with a further dip in prices reported on most grades. No. 1 heavy melting steel is off to a spread of $34 to $35 delivered on the basis of two small sales. The $34 price reflects deliveries on a truck basis. No. 1 bundles and No. 1 bushéling are off nominally to $34 to $35. No. 2 heavy melting is now quotable at $31 to $32, delivered, and No. 2 bundles at nominally $30, delivered.

Further revisions include a price of $37, delivered, on electric furnace bundles, $22 on machine shop turnings, $24 on mixed borings and turnings, $26 on short shovel turnings, $40 on low phos structurals and plate, $34 on heavy turnings and $42 on couplers, springs and wheels. Most of these revisions are largely nominal.

Cast grades generally are showing further weakness. No. 1 cupola cast is off at $35 to $36, heavy breakable cast to $37, unstripped motor blocks $29, and drop broken machinery $42 to $43.

Pittsburgh—Scrap prices continue their downward trend, most major grades dropping $1 a ton. No. 1 heavy melting is quoted at $39 to $40.

Cleveland—In the continued absence of consumer buying the iron and steel scrap market in this area is at a standstill and with tonnage piling up in dealers' yards prices continue to trend downward. Generally, the market on steelmaking and blast furnace grades is off another $1 per ton this week, though prices are largely nominal reflecting dealers' and brokers' views, not actual sales.

Detroit—Scrap trading remains at a standstill with only a few minor transactions reported last week. Prices quoted, therefore, are nominal with indications that further declines

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will be apparent when market activity returns.

Cincinnati — Consumers are continuing to reduce their inventories so scrap here has no home. All prices are strictly nominal and most are quoted lower.

Chicago — Prices continue to be largely nominal in the face of only minor sales. However, these few and small sales have been made at prices $1 lower than the immediately preceding nominal quotes.

St. Louis — Scrap prices dipped again as consumers almost unanimously refuse to renew expiring orders.

Unusually heavy offerings by railroads last week, which have been getting excellent deliveries on new replacement steel, found few takers and prices softened $1 to $3.

Los Angeles — Steelmaking scrap market is weaker but prices are unchanged. Some trade observers believe the mills would like to see the current price level retained to limit pressure of scrap dealers to export. Despite the reluctance of steel producers to see steel scrap leave the country, these observers forecast the lifting of the bars on scrap exports by January.

Seattle — Large buyers of steel scrap are getting sufficient material to cover immediate needs. However, there is no apparent surplus as conditions are unfavorable to larger dealer stocks. There is a surplus of bundles and a drop in the price is expected. Cast iron is plentiful. Stove plate is quoted $26, delivered Portland, Oreg. Foundries report no shortage of materials.

Pig Iron . . .

Pig Iron Prices, Page 156

Philadelphia—With consumption of foundry pig iron still slack, producers are increasing their sales efforts. Following the recently announced drop of $2 per ton at Swedeland, Pa., there have been no further adjustments in the base prices of domestic furnaces. However, indications point to keener competition from foreign producers, some of whom report a further drop in demand on the other side.

That import prices have not reflected this lag in demand in Europe more sharply is ascribed in part to the continued high cost of raw materials, particularly iron ore.

Demand for pig iron has not picked up as anticipated since the end of the summer vacation season. Some gray iron foundries are now operating only four days a week.

New York — Pig iron demand is disappointing. Anticipated improvement following Labor Day has failed to materialize and, in fact, the lag appears even more pronounced, with no indications of immediate betterment.

Pittsburgh — Merchant pig iron moves slowly due to inventory attention and reduced foundry operations.

Cleveland — Merchant iron is moving at a slower pace with foundry demand noticeably less pressing, but so far as can be learned enough business is developing to take up production. No piling of iron at furnaces is reported in this area as is reported at some other producing centers.

Chicago — Sellers of merchant iron and foundry coke are out looking for business. Gray iron foundries are operating at only a portion of their capacity, largely because of the slowness in the agricultural implement business, but also because of an easing in demand for automotive castings. Prices on merchant iron and coke remain unchanged.

Not only are gray iron foundries feeling a lull in business but so are the steel foundries. Two of them with plants in Illinois are laying off employees. One will lay off 600 by Oct. 1 and the other already has laid off 150 and expects to furlough more.

St. Louis — Producers' ground inventories of basic pig iron have risen in anticipation of one stack going down soon for relining.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 155

Cleveland — There is plenty of oven foundry coke around with stocks estimated at 60 days or more. At the same time, while foundry operations reportedly are slightly better than a month ago, demand pressure on coke sellers is not strong.

Last week the American Steel & Wire Division, U. S. Steel Corp., relighted a battery of 15 coke ovens here that have been down for rebuilding. This battery of 15 is the third to be completely rebuilt at the works in the last four years.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1,150 tons, bakery, National Biscuit Co., Philadelphia, to Ingalls Iron Works, Birmingham, Ala.

1,320 tons, state thruway bridges, Ulster county, N. Y., through John Arbotia, Inc., and Corbetta Construction Co., to Phoenix Bridge Co., Phoenixville, Pa.

900 tons, Columbia river, Umatilla county, Oreg., bridge, to American Bridge Division, U. S. Steel Corp.; low $2,186,913 by county court.

2,660 tons, state thruway bridge work, Herkimer county, N. Y., to Phoenix Bridge Co., Phoenixville, Pa.

2,200 tons, municipal jail, Brooklyn, N. Y., to Harris Structural Steel Co., New York city.

750 tons, four bridges for Central Railroad of New Jersey, Dunellen and Plainfield, N. J., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

620 tons, steel sheet piling, Corps of Engineers, Kansas City, Mo., to U. S. Steel Corp., Pittsburgh.

500 tons, chipper and barker plant, Rayonier Inc., Port Angeles, Wash., to Leckenby Structural Steel Co., Seattle.

500 tons, three bridges, Rancheria river, Alaska highway, to Marwell Construction Co., Vancouver, B. C., low $777,000, by Canadian government.

435 tons, manufacturing plant and warehouse, General Electric Co., Allentown, Pa., to Bethlehem Fabricators, that city.

410 tons, Fulton Savings Bank, Brooklyn, N. Y., through Tidewater Building Co. Inc., to Schacht Steel Construction Inc., New York.

200 tons, mining mill for Buenos Aires, The Argentine, interest to Lackenby Structural Steel Co., Seattle.

150 tons, four buildings for tank testing facilities, Boeing Airplane Co., Seattle, to Leckenby Structural Steel Co., and Soule Steel Co., Seattle.

130 tons, factory building, Hamden, Conn., to New England Iron Works, New Haven, Conn., through Leo F. Caproni Associates, New Haven.

105 tons, warehouse and manufacturing building, Walgreen Drug Co., to Elizabeth Iron Works, Elizabeth, N. J.

100 tons, steel yard craneway, Boeing Airplane Co., Seattle, to Leckenby Structural Steel Co., Seattle.

STRUCTURAL STEEL PENDING

12,500 tons, towers and anchorages, contract No. 4, bridge between Philadelphia and Gloucester, N. J., for Delaware River Port Authority, Philadelphia, bids Oct. 15.

2200 tons, medium bomber hangar, Westover field, Chicopee, Mass.

(Please Turn to Page 160)

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Sept. 24	$36.50
Sept. 17	37.50
Aug. avg.	43.40
Sept. 1952	43.00
Sept. 1948	43.33

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*39.00-40.00*
No. 2 heavy melting	*35.00-36.00*
No. 1 bundles	*39.00-40.00*
No. 2 bundles	*33.00-34.00*
No. 1 busheling	*39.00-40.00*
Machine shop turnings	*23.00-24.00*
Mixed borings, turnings	*26.00-27.00*
Short shovel turnings	*28.00-29.00*
Cast iron borings	*27.00-28.00*
Cut structurals	*44.00-44.00*
Heavy turnings	*35.00-36.00*
Punchings & plate scrap	*44.00-44.00*
Electric furnace bundles	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	40.00-41.00
Charging box cast	39.00-39.00
Heavy breakable cast	37.00-38.00
Unstripped motor blocks	*33.00-34.00*
No. 1 machinery cast	*47.00-48.00*

Railroad Scrap

No. 1 R.R. heavy melt	*41.00-42.00*
Rails, 2-ft. and under	51.00-52.00
Rails, 18-in. and under	52.00-53.00
Rails, random lengths	*46.00-47.00*
Railroad specialties	46.50-47.50

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*42.00-43.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 bundles	*42.00-43.00*
No. 2 bundles	*37.00-38.00*
No. 1 busheling	*42.00-43.00*
Machine shop turnings	*16.00-17.00*
Mixed borings, turnings	23.00-24.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	*43.00-44.00*
Alloy free, short shovel turnings	*24.00-25.00*
Electric furnace bundles	*44.00-45.00*

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	*50.00-51.00*
Stove plate	*48.00-49.00*
Heavy breakable cast	*28.00-29.00*
Unstripped motor blocks	25.00-26.00
Brake shoes	*41.00-42.00*
Clean auto cast	42.00-43.00
No. 1 wheels	*42.00-43.00*
Burnt cast	32.00-33.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt	40.00-41.00
R.R. malleable	45.00-46.00
Rails, 2-ft. and under	*50.00-51.00*
Rails, 18 in. and under	*51.00-52.00*
Rails, random lengths	44.00-45.00
Cast steel	43.00-44.00
Railroad, specialties	*44.00-45.00*
Uncut ties	*44.00-45.00*
Angles, splice bars	46.00-47.00
Rails, rerolling	49.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	34.00-35.00
No. 1 bundles	36.00-37.00
No. 2 bundles	30.00-31.00
Machine shop turnings	*16.00-17.00*
Short shovel turnings	*20.00-21.00*
Cast iron borings	*20.00-21.00*
Low phos.	*34.00-40.00*
Electric furnace bundles	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt	40.00-41.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*30.00*
No. 1 busheling	*34.00-35.00*
Electric furnace bundles	*37.00*
Machine shop turnings	*22.00*
Mixed borings, turnings	*24.00*
Short shovel turnings	*26.00*
Structurals & plate	*40.00*
Heavy turnings	*34.00*
Couplers, spring, wheels	*42.00*

Cast Iron Grades

No. 1 cupola	*35.00-36.00*
Charging box cast	*nom.*
Heavy breakable cast	*37.00*
Unstripped motor blocks	*29.00*
Drop broken machinery	*42.00-43.00*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*26.50-27.50*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*26.50-27.50*
No. 2 bundles	*22.00-23.00*
Machine shop turnings	*14.00-15.00*
Mixed, borings, short turnings	*17.00-18.00*
Low phos. (structural & plate)	*29.00-30.00*
Short shovel turnings	*18.50-19.00*

Cast Iron Grades

No. 1 cupola	*30.00-31.00*
Unstripped motor blocks	21.00-22.00

DETROIT

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	26.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00
No. 1 busheling	33.00-34.00
Machine shop turnings	15.00
Mixed borings turnings	15.00
Short shovel turnings	17.00
Punchings & plate scrap	37.00-38.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	34.00-35.00
Stove plate	34.00-35.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	42.00-43.00
Malleable	44.00

CINCINNATI

(Brokers' buying prices)

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	*33.00-34.00*
No. 2 bundles	*27.00-28.00*
No. 1 busheling	*33.00-34.00*
Machine shop turnings	*15.00**
Mixed borings, turnings	*18.00**
Short shovel turnings	*19.00**
Cast iron borings	*18.00**

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	*36.00*
Heavy breakable cast	36.00
Drop broken machinery	47.00

Railroad Scrap

No. 1 R.R., heavy melt.	*36.00-37.00*
Malleable	*45.00-46.00*
Rails, 18 in. and under	*49.00-50.00*
Rails, random length	*40.00-41.00*

*F.o.b. shipping point.

CHICAGO

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	30.00-32.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles	*33.00-34.00*
No. 2 bundles	29.00-30.00
No. 1 busheling	34.00-35.00
Machine shop turnings	15.00-17.00
Mixed borings, turnings	16.00-18.00
Short shovel turnings	16.00-18.00
Cast iron borings	16.00-18.00
Cut structurals, 3-ft.	37.00-38.00
Punchings & plate scrap	*40.00-42.00*
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	34.00-36.00
Stove plate	*29.00-30.00*
Unstripped motor blocks	31.00-33.00
Clean auto cast	41.00-43.00
Drop broken machinery	40.00-42.00

Railroad Scrap

No. 1 R.R. heavy melt	37.00-38.00
R.R. Malleable	40.00-42.00
Rails, 2-ft. and under	*45.00-47.00*
Rails, 18 in. and under	*46.00-47.00*
Angles, splice bars	*43.00-45.00*
Rails, rerolling	*50.00-52.00*

BIRMINGHAM

No. 1 heavy melting	26.00-26.50
No. 2 heavy melting	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Machine shop turnings	19.50-20.50
Short shovel turnings	21.50-22.50
Cast iron borings	17.00-17.50
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate	38.00-39.00
Cut structurals	36.00-37.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt	nom.
Rails, 2-ft and under	42.00-43.00
Rails, random lengths	39.00-40.00
Angles, splice bars	45.00-46.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	32.00-33.00
No. 2 bundles	*27.00-28.00*
Machine shop turnings	15.00-16.00
Short shovel turnings	17.00-18.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Charging box cast	*28.00-29.00*
Heavy breakable cast	*28.00-29.00*
Unstripped motor blocks	*28.00-29.00*
Brake shoes	38.00-39.00
Clean auto cast	38.00-40.00
Burnt cast	29.00-30.00

Railroad Scrap

Malleable	*41.00-42.00*
Rails, 18 in. and under	*46.00-47.00*
Rails, random lengths	*37.00-39.00*
Uncut ties	*38.00-40.00*
Angles, splice bars	*40.00-41.00*
Rails, rerolling	42.00-43.00

BUFFALO

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	35.00-35.50
No. 1 bundles	39.00-40.00
No. 2 bundles	33.00-33.50
No. 1 busheling	39.00-40.00
Machine shop turnings	21.00-21.50
Mixed borings, turnings	26.00-26.50
Short shovel turnings	27.00-27.50
Cast iron borings	26.00-26.50
Low phos.	45.00-46.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	33.50
No. 1 machinery	37.50-38.00

Railroad Scrap

Rails, random lengths	41.00-42.00
Rails, 2 ft and under	47.00-48.00
Railroad specialties	47.00-47.50

BOSTON

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	*26.00-26.50*
No. 2 heavy melting	*22.00-22.50*
No. 1 bundles	*26.00-26.50*
No. 2 bundles	*20.00-20.50*
Machine shop turnings	*10.50-11.00*
Mixed borings, turnings	*15.50-16.00*
Short shovel turnings	*16.00-16.50*
No. 1 cast	*29.00-30.00*
Mixed cupola cast	*25.00-25.50*
No. 1 machinery cast	*36.00-37.00*

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	*31.00-33.00*
No. 2 heavy melting	*29.00-31.00*
No. 1 bundles	*28.00*
No. 2 bundles	23.00
No. 3 bundles	19.00
Machine shop turnings	14.00
Mixed borings, turnings	14.00
Short shovel turnings	14.00
Electric furnace, No. 1	38.00-40.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00-30.00
Unstripped motor blocks	27.00
No. 1 wheels	38.00-40.00
Stove plate	26.00

Railroad Scrap

Rails, random lengths	34.00-35.00

SAN FRANCISCO

No. 1 heavy melting	27.00
No. 2 heavy melting	23.00
No. 1 bundles	24.00
No. 2 bundles	23.00
No. 1 busheling	27.00
Machine shop turnings	9.00
Mixed borings, turnings	9.00
Short shovel turnings	13.00
Cast iron borings	13.00
Cut structurals	32.00
Heavy turnings	13.00
Punchings & plate scrap	32.00
Electric furnace bundles	24.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	24.00
No. 2 heavy melting	20.00
No. 1 bundles	23.00
No. 2 bundles	20.00
Machine shop turnings	8.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	37.00-40.00

HAMILTON, ONT.

(Delivered prices)

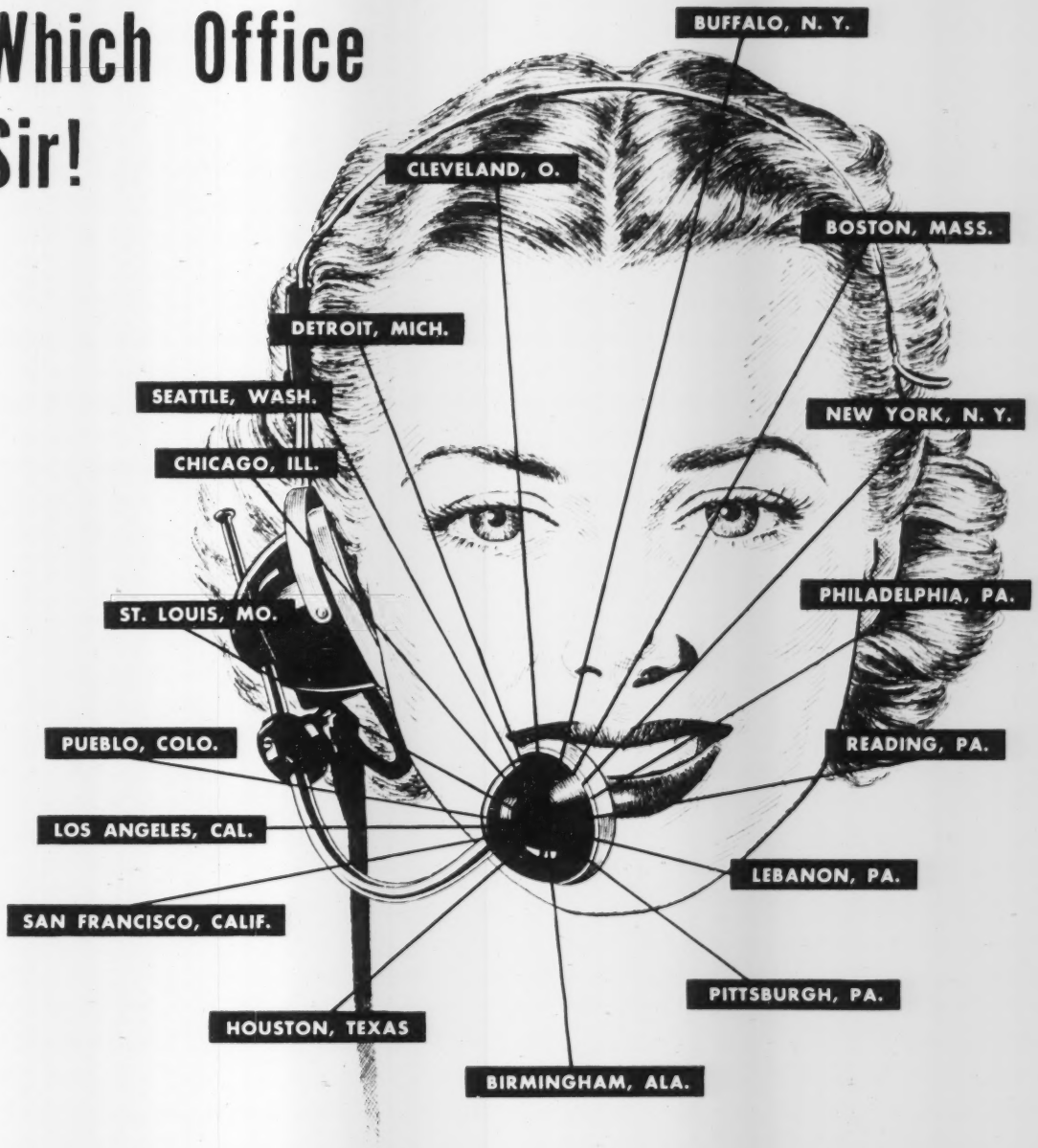
Heavy melting	$32.50
No. 1 bundles	32.50
No. 2 bundles	32.50
Mechanical bundles	28.50
Mixed steel scrap	28.50
Mixed borings, turnings	26.50
Rails, remelting	32.50
Rails, rerolling	41.50
Busheling	26.50
Busheling new factory:	
Prep'd	30.50
Unprep'd	28.50
Short steel turnings	22.50

Cast Iron Grades

No. 1 machinery cast	46.00-50.00

†F.o.b., shipping point.

Which Office Sir!



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Phone: Gaspee 1-5573, 1-8573

(Concluded from Page 157)

1793 tons, comprising 983 tons for the Garden State Parkway, contract No. 28, section 11, Atlantic county, New Jersey, and 810 tons, Contract No. 31, section 11, also Atlantic county, bids Oct. 3; the two projects involved may be bid on a combined basis, or separately.

600 tons, gymnasium, Providence College, Providence, R. I.

325 tons, state bridge, Newark, N. J., P. T. Cox low on general contract.

340 tons, Garden State Parkway, Contract No. 63, section 3, Essex county, New Jersey, bids Oct. 9.

330 tons, substation steel, Screw Machine Products Co., Portland, Oreg., to Bonneville Power Administration.

295 tons, substation steel, Bethlehem Pacific Coast Steel Corp., Seattle, low to Bonneville Power Administration, Portland, $81,524.

280 tons, state bridge, Mercer county, New Jersey, bids being advertised for Nov. 6; also 55,500 square feet of steel sheet piling.

235 tons, high school, Sturbridge, Mass., Louis Neri Co., Milbury, Mass., low.

200 tons, civic auditorium, Spokane, Wash., Henry George & Sons, Spokane, low base $1,079,013.

110 tons, two plate girder track scales, Pennsylvania railroad, Philadelphia, bids closed.

100 tons, (estimated), 116-ft. Montana state highway span, general contract to Walter Mackin & Sons, Billings, Mont., low $58,374.

REINFORCING BARS . . .

REINFORCING BARS PLACED

530 tons, Umatilla county bridge, Columbia river, Oregon, to Cascade Construction Co. and Austin Construction Co., Seattle, low $676,309.

100 tons, addition to Tacoma steam power plant, to J. D. English Steel Co., Tacoma, Wash., low $12,700.

REINFORCING BARS PENDING

2000 tons, bridges and highways, Trumbull and Erie counties, Ohio, bids Oct. 8; Ohio Turnpike Commission, Columbus.

220 tons, addition to Washington state Medical Lake hospital, general contract to Busboom & Raugh, Spokane, Wash., low base $466,940.

125 tons, Washington state highway projects, Skagit, Grays Harbor counties, bids to Olympia Oct. 6.

PLATES . . .

PLATES PLACED

100 tons, 250,000-gal. water storage tank, for Steilacoom, Wash., to Pittsburgh-Des Moines Steel Co., Seattle, low $16,628.

PLATES PENDING

300 tons, estimated, 38 vertical knockdown tanks, Corps of Army Engineers, Philadelphia, bids Sept. 28; 24 of the tanks will be 1000-barrels capacity, 8 of 3000-barrels, and 6 of 10,000-barrels.

300 tons, including shapes, Washington state ferry unit, bids called at Seattle, delayed, Sept. 30.

PIPE . . .

CAST IRON PIPE PLACED

100 tons, 10 and 8-in., to Pacific Cast Iron Pipe Co., Portland, Oreg., by North Bend, Oreg.

CAST IRON PIPE PENDING

500 tons, various sizes, for municipal inventory, bids opened at Portland, Oreg., Sept. 21.

RAILS, CARS . . .

LOCOMOTIVES PENDING

Alaska railroad, six 1500-hp. each, various types, diesel electric; bids by American Locomotive Co., General Electric Co., and Fairbanks, Morse & Co., forwarded to Alaska for decision.

RAILS PENDING

Pennsylvania railroad, 100,000 tons, bids Sept. 30.

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CHICAGO 8, ILL.

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32" x 23" centers, PITTSBURGH Lathe, Timken Bearings, two carriage with power traverse to each, late type.
30" x 14" American G. H. Lathe, 12 speeds.
25-50 x 6/10 LeBlond Sliding Bed Gap Lathe, Timken Bearing.
24" x 12' bed, Lodge & Shipley G. H. Lathe, 12 spindle speeds.
16" x 126" centers, Lodge & Shipley G. H. Lathe, Timken Bearing, complete with taper attachment, late type.
16" x 8' American, 3 S C D, 56" center distance, 1¾" hole in spindle.
16" x 6' Lodge & Shipley, single pulley drive, 12 spindle speeds.
9" x 36" Hardinge Precision Lathe.
Gisholt H. Saddle Type Turret Lathe, bar feed, late type.
Cincinnati #2 Centerless Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Landis 26" x 168" Plain Cylindrical Grinder.
Brown & Sharpe #2 Surface Grinder.
Norton 10 x 24 Surface Grinder.
Jones & Lamson 8 x 31 Thread Grinder.
Oliver Template Tool Bit Grinder.
Sellers 4 T Tool Grinder, motor drive.
Sellers 6 T Tool Grinder, late type.
Cincinnati 12" x 36" Universal Grinder, new 1948.
Heald 42 Borematic.
King 42" Vertical Boring Mill, 2 heads.
Niles 36-41 Boring Mill.
Niles 42"-50" Driving Box Borer, Burnisher & Facer, late type.
Fellows 724 Gear Shaper with Spur Guide.
Fellows 612 Spur Gear Shaper.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
American 5-14" Column Triple Purpose Radial Drill, motor driven thru Turner gear box on arm.
American 4-11" column Triple Purpose Radial Drill, motor driven thru Turner gear box on arm.
Brown & Sharpe 3A Universal Miller.
Milwaukee 2 HL Plain Miller, Late Type.
Hall Planetary Style D Miller.
Cleveland 30 x 30 x 10' Openside Planer, self-contained motor drive.
Niles 48" x 48" x 16' Double Housing Planer, 4 heads, box table, D.C. reversible drive.
Bliss #58 Drawing Press 5" Stroke.
Brown & Sharpe 5-26 Gear Cutter.
Gould & Eberhardt 96H Hobber.
Niles 12" x ⅞" Initial Type Bending Roll.

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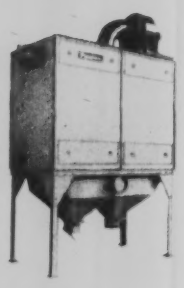

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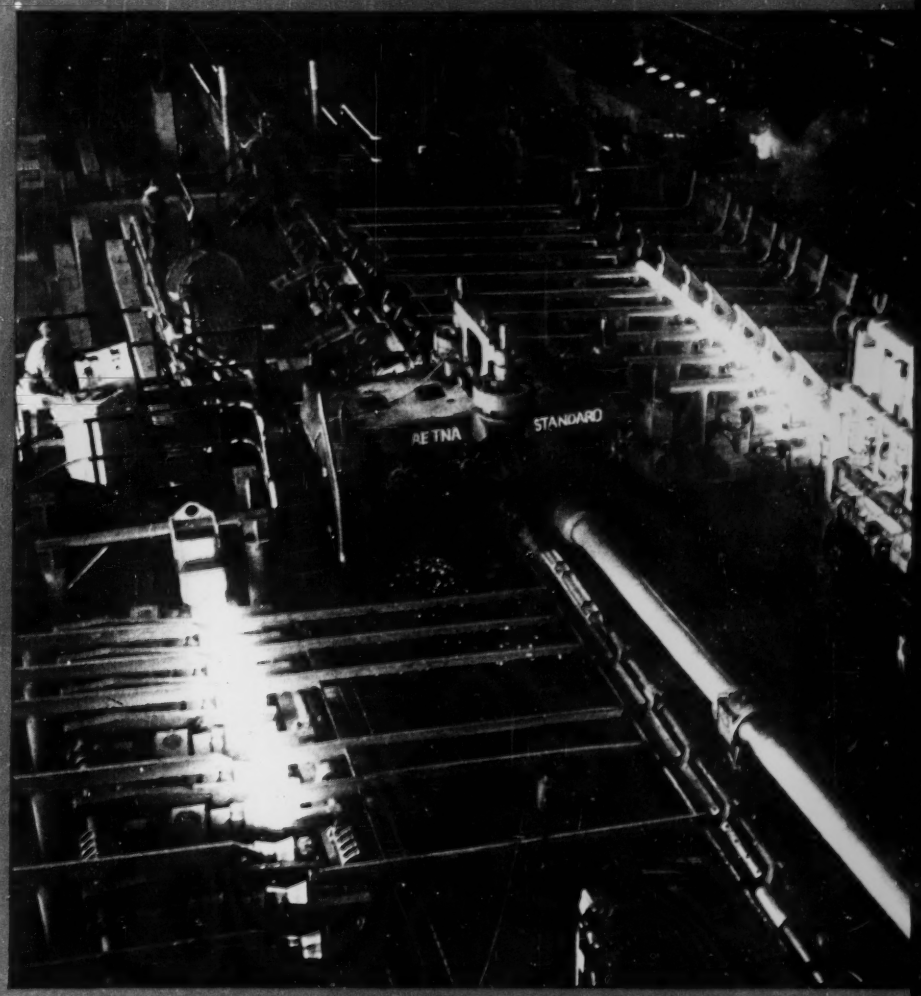
seamless tube mills

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

When a company considers an investment of the size and scope of a seamless tube mill, they can only consider a manufacturer which has facilities, experience, integrity and financial stability. The name Aetna-Standard appears in the majority of the world's tube producers today. Recent installations include two mills for sizes 2¾" to 9⅝" to produce oil country and mechanical tubing; three (assel type) for production of bearing tubing.

Aetna makes mills to produce seamless tubing in lengths of 50 feet and a complete diameter range between 1½" to 26".



THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.
Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.
M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America.
Societe de Constructions de Montbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.
Duncp Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.
Compagnia Italiana Forno Acciaio, Milano, Italy — Italy.
Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.
Hale & Kilgren, Inc., Akron, Ohio — Representative for the Rubber Industry.

Designers and Builders to the Ferrous, Non-Ferrous, Leather, Rubber, and Plastic Industries

Straightens pipe at rate of 700 feet a minute with rolls on TIMKEN® bearings

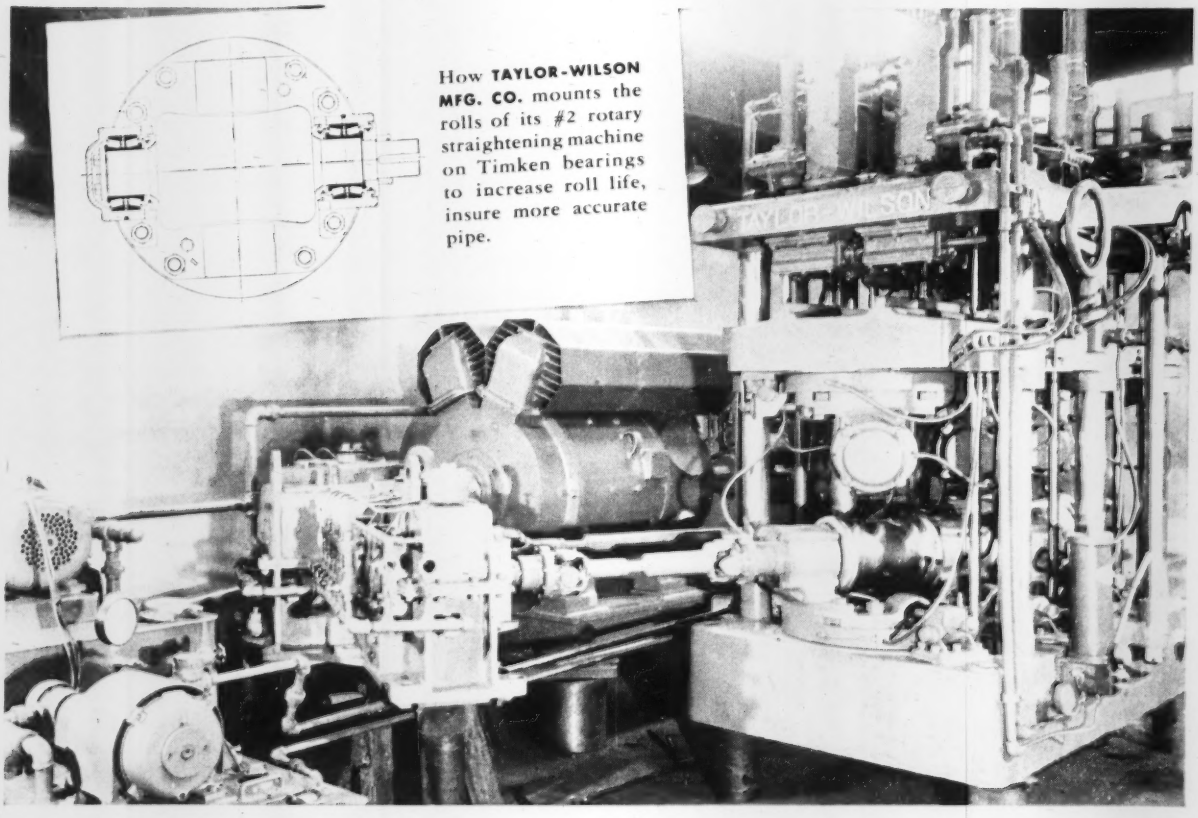
JUST imagine the force required to straighten .840" to 4.5" O.D. pipe at speeds up to 700 feet a minute! Pipe straightening machines have to be rugged—that's why Taylor-Wilson engineers mounted the driven and idler rolls of their #2 rotary straightening machine on Timken® tapered roller bearings and why they use Timken bearings throughout the drive.

Timken bearings help increase roll life by maintaining path alignment. Their tapered construction takes all radial and thrust loads in any combination. They hold rolls rigidly, keep them rolling true. Pipe is straightened more accurately.

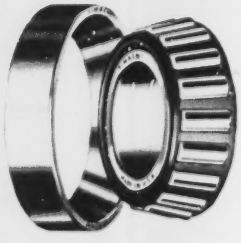
You can put these same advantages *and more* to work for you. Just specify Timken bearings in the machinery you build or buy. Make sure the trade-mark "Timken" is stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.

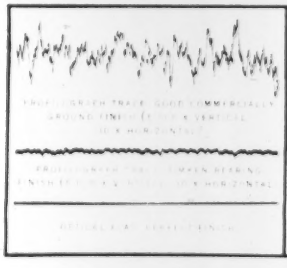


How **TAYLOR-WILSON MFG. CO.** mounts the rolls of its #2 rotary straightening machine on Timken bearings to increase roll life, insure more accurate pipe.



TIMKEN

TAPERED ROLLER BEARINGS



SMOOTH TO MILLIONTHS OF AN INCH

Surface finish of high quality Timken bearing rollers and races is so smooth that it takes a profilograph to measure its smoothness. This instrument measures surface variations to a millionth of an inch, as shown at the left.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION